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MCB CAMP LEJEUNE  
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FINAL FOCUSED PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT FOR CAMP  
JOHNSON CONSTRUCTION AREA AND MILITARY MUNITIONS RESPONSE PROGRAM SITE  
UXO-20 MCB CAMP LEJEUNE NC  
4/1/2011  
CH2M HILL



**Final**  
**Focused Preliminary Assessment/  
Site Inspection**  
**Camp Johnson MILCON Area and  
Military Munitions Response Program UXO-20**  
Marine Corps Base Camp Lejeune  
Jacksonville, North Carolina



Prepared for  
**Department of the Navy**  
**Naval Facilities Engineering Command**  
**Mid-Atlantic**

Contract No.  
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**April 2011**

Prepared by  
**CH2MHILL®**



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**Focused Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area and  
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Jacksonville, North Carolina**

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Under the

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# Executive Summary

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This Preliminary Assessment/Site Inspection (PA/SI) presents data, results, and conclusions of the investigations conducted at the Camp Johnson Construction Area (CJCA), Marine Corps Base Camp Lejeune (MCB CamLej), North Carolina. The CJCA includes:

- Military Munitions Response Program (MMRP) UXO-20 (Former 1,000-inch Range [ASR #2.32] and Former A-1 50-foot .22 Caliber Range [ASR #2.87]);
- Solid Waste Management Unit (SWMU) 46/Installation Restoration (IR) Site 15-Former Montford Point Burn Dump;
- SWMU 47/IR Site 17-Montford Point Area Rip Rap; and
- SWMU 241/IR Site 85-Former Camp Johnson Battery Dump.

The scope of the work was provided by Naval Facilities Engineering Command (NAVFAC) – Mid Atlantic Division, NAVFAC CLEAN 1000 Program Contract N62470-08-D-1000. Field investigation activities were conducted in accordance with the *Site-Specific Work Plan Addendum for Focused Preliminary Assessment/Site Inspection– Camp Johnson MILCON Area, Marine Corps Base Camp Lejeune, North Carolina* (CH2M HILL, 2009). The Work Plan was approved by NAVFAC, MCB CamLej, the U.S. Environmental Protection Agency (EPA), and the North Carolina Department of Environment and Natural Resources (NCDENR).

MCB CamLej is planning a military construction (MILCON) project within the CJCA. This focused PA/SI was conducted to identify and characterize potential environmental impacts associated with the use of UXO-20 and the SWMU/IR sites, evaluate the potential risks to human health and the environment posed by historical land use practices, and evaluate whether additional investigation and/or remediation activities are necessary.

Field activities included land surveying, vegetation clearing, buried utility locating, environmental sampling, and excavation of test trenches. Environmental sampling activities consisted of the collection of surface soil, subsurface soil, groundwater, and discarded batteries for laboratory analysis. Soil concentrations were compared to North Carolina Soil Screening Levels (NCSSLs) (NCDENR, 2010), EPA Industrial and Residential Soil Adjusted Regional Screening Levels (RSLs) (EPA, 2010), and twice the mean Base background concentrations (Base background) for inorganic constituents (Baker, 2001). Groundwater samples were compared to North Carolina Groundwater Quality Standards (NCGWQS) (NCDENR, 2010), EPA Tap Water RSLs (EPA, 2010), EPA's maximum contaminant levels (MCLs) (EPA, 2009b), and twice the Base background for inorganic constituents (Baker, 2001). A summary of the results from these investigation activities is provided below.

## UXO-20

Two-hundred fourteen surface soil samples, 77 subsurface soil samples, and 37 groundwater samples were collected from UXO-20 for analysis of select metals (antimony, arsenic, copper, lead, and zinc).



## Surface and Subsurface Soil

Arsenic was the most prevalent metal detected in surface and subsurface soils across UXO-20, with concentrations exceeding regulatory criteria and twice the Base background. No other analyzed metals were detected at concentrations exceeding both twice the Base background and regulatory screening criteria.

## Groundwater

Two metals, arsenic and lead, were detected at concentrations exceeding regulatory screening criteria and twice the Base background in groundwater samples collected at UXO-20.

## IR Site 15

Ten surface soil samples, ten subsurface soil samples, and five groundwater samples were collected from IR Site 15. The samples were analyzed for volatile organic compounds (VOCs), semi-VOCs (SVOCs), polychlorinated biphenols (PCBs), organochlorine pesticides (OCPs), target analyte list (TAL) metals, and dissolved TAL metals (groundwater only).

### Surface Soil

VOCs or SVOCs were not detected at concentrations exceeding regulatory criteria in surface soil samples collected at IR 15. One PCB, arochlor-1254, was detected above regulatory criteria at one surface soil sample location. One pesticide, dieldrin, was detected above regulatory criteria at two surface soil sample locations. Four metals were detected at concentrations exceeding regulatory criteria and twice the Base background in surface soil samples at IR 15, including aluminum, arsenic, chromium, and iron.

### Subsurface Soil

VOCs, SVOCs, or PCBs were not detected at concentrations exceeding regulatory criteria in subsurface soil samples collected at Site 15. One pesticide, dieldrin, was detected above regulatory criteria at one subsurface soil sample location. Five metals were detected at concentrations exceeding regulatory criteria and twice the Base background in subsurface soil samples, including arsenic, chromium, iron, lead, and manganese.

### Groundwater

VOCs, SVOCs, OCPs, or PCBs were not detected at concentrations exceeding regulatory criteria in groundwater samples collected at Site 15. Three metals were detected at concentrations exceeding both twice the Base background and regulatory criteria in groundwater samples, including, chromium, iron, and manganese. Two dissolved metals, iron and manganese, were detected at concentrations exceeding regulatory criteria and twice the Base background.



## IR Site 17

Five surface soil samples, five subsurface soil samples, and two groundwater samples were collected from IR Site 17. The samples were analyzed for VOCs, SVOCs, PCBs, OCPs, TAL metals, and dissolved TAL metals (groundwater only).

### Surface Soil

VOCs, SVOCs, OCPs, or PCBs were not detected at concentrations exceeding regulatory criteria in surface soil samples collected at Site 17. Three metals (arsenic, chromium, and iron) were detected at concentrations exceeding regulatory criteria and twice the Base background in surface soil samples.

### Subsurface Soil

One VOC, 1,2-dibromo-3-chloropropane, was detected above regulatory criteria in one subsurface soil sample at Site 17. SVOCs, pesticides, or PCBs were not detected above regulatory criteria in the subsurface soil samples. Four metals were detected at concentrations exceeding regulatory criteria and twice the Base background in subsurface soil samples, including aluminum, arsenic, chromium, and iron.

### Groundwater

Chloroform was detected at a concentration exceeding regulatory criteria in one groundwater sample collected at Site 17. SVOCs, OCPs, or PCBs were not detected in the groundwater samples at concentrations exceeding regulatory criteria. Metals and dissolved metals were not detected in the groundwater samples at concentrations exceeding regulatory criteria and twice the Base background.

## IR Site 85

Thirteen surface soil samples, 12 subsurface soil samples, and nine groundwater samples were collected from IR Site 85. The samples were analyzed for VOCs, SVOCs, PCBs, OCPs, the TAL metals and dissolved TAL metals (groundwater only). A representative sample of the discarded batteries observed at IR Site 85 was collected and analyzed for TAL metals.

### Surface Soil

VOCs, SVOCs, or PCBs were not detected at concentrations exceeding regulatory criteria in surface soil samples collected at Site 85. Dieldrin was detected above regulatory criteria at two surface soil sample locations. Eleven metals were detected at concentrations exceeding regulatory criteria and twice the Base background in surface soil samples at IR Site 85, including antimony, arsenic, cadmium, chromium, cobalt, iron, lead, manganese, mercury, thallium, and zinc.

### Subsurface Soil

One VOC, 1,2-dibromo-3-chloropropane, was detected above regulatory criteria in one subsurface soil sample location at Site 85. SVOCs, pesticides, or PCBs were not detected above regulatory criteria in the subsurface soil samples. Two metals, aluminum and arsenic, were detected at concentrations exceeding regulatory criteria and Base background in subsurface soil samples.



## Groundwater

Methylene chloride was detected in two groundwater samples collected at IR 85. SVOCs, OCPs, or PCBs were not detected in the groundwater samples at concentrations exceeding regulatory criteria. Three metals were detected in the groundwater samples at concentrations exceeding regulatory criteria and Base background in the groundwater samples, including, aluminum, iron, and chromium. One dissolved metal, iron, was detected in the groundwater samples at concentrations exceeding regulatory criteria and twice the Base background.

## Discarded Batteries

Eleven metals were detected in the battery sample collected from IR Site 85. Of these, lead and mercury were detected at concentrations exceeding the EPA maximum toxicity characteristic. Therefore, upon removal, the batteries were treated as hazardous waste.

## Human Health and Ecological Risk Screening

A preliminary human health risk screening (HHRS) and ecological risk screening (ERS) were performed to evaluate potential pathways and associated risks to human health and ecological receptors from exposure to soil and groundwater at the CJCA. A brief summary of the HHRS and ERS findings is presented below by assessment area.

### UXO-20

Based on the analytical data for surface soil, subsurface soil, and groundwater samples collected from UXO-20, constituents detected do not present any unacceptable risks to human health or populations of ecological receptors.

### IR Site 15

Based on the analytical data for surface and subsurface soil samples collected at Site 15, detected constituents do not present an unacceptable risk to human health. However, chromium was identified as a constituent of potential concern (COPC) in groundwater. Exposure to groundwater at Site 15 may present an unacceptable risk to human health and further assessment is recommended.

Based on the analytical data collected from Site 15, exposure to PCBs and metals in surface soil and pesticides and metals in subsurface soils present potentially unacceptable risks to ecological receptors. Further assessment is recommended. No unacceptable risks to ecological receptors were identified in groundwater at Site 15.

### IR Site 17

Based on the analytical data for surface soil, subsurface soil, and groundwater samples collected from Site 17, constituents detected do not present any unacceptable risks to human health or populations of ecological receptors.



## IR Site 85

Based on the analytical data collected at Site 85, exposure to groundwater may present an unacceptable risk to human health due to chromium, based on the screening value for hexavalent chromium. Further assessment of groundwater is recommended. Unacceptable human health risks were not identified for surface and subsurface soils.

Based on surface soil samples collected at Site 85, exposure to metals presents a potentially unacceptable risk to ecological receptors and further assessment is recommended. Unacceptable risks to populations of ecological receptors were not identified for subsurface soil and groundwater.



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# Acronyms and Abbreviations

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µg/kg	micrograms per kilogram
µg/L	micrograms per liter
amsl	above mean sea level
ASR	archive search report
Baker	Baker Environmental, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJCA	Camp Johnson Construction Area
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	chain-of-custody
COPCs	constituents/chemicals of potential concern
CSF	cancer slope factor
CSI	Comprehensive Site Investigation
CSM	conceptual site model
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DPT	direct-push technology
ERS	ecological risk screening
ESV	ecological screening value
FFA	federal facilities agreement
FID	flame-ionization detector
ft bgs	feet below ground surface
HHRA	human health risk assessment
HHRS	human health risk screening
HI	hazards index
HQ	hazard quotient
IDW	investigation-derived waste
IEUBK	Integrated Exposure Uptake Biokinetic
IR	Installation Restoration
IRIS	Integrated Risk Information System
m	meter
MCB CamLej	Marine Corps Base Camp Lejeune
MCCSS	Marine Corps combat service support school
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MILCON	military construction



NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NCDENR	North Carolina Department of Environment and Natural Resources
NCGWQS	North Carolina Groundwater Quality Standards
NC SSL	North Carolina Soil Screening Limit
NFA	no further action
NRWQC	national recommended water quality criterion
NTCRA	non-time-critical removal action
OCP	organochlorine pesticide
PAH	polycyclic aromatic hydrocarbon
PA/SI	Preliminary Assessment/Site Inspection
PCB	polychlorinated biphenyl
Pre-RI	Pre-Remedial Investigation
PRG	preliminary remediation goals
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RSL	regional screening level
SI	Site Investigation
SOP	standard operating procedure
SSL	soil screening level
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TAL	target analyte list
TCL	target compound list
UCL	upper confidence limit
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
VOC	volatile organic compound
XRF	x-ray fluorescence



# Introduction

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Marine Corps Base Camp Lejeune (MCB CamLej) is planning a military construction (MILCON) project covering approximately 240 acres within the Camp Johnson Construction Area (CJCA), identified on **Figure 1-1**. Due to the various historical land uses within the CJCA, it was necessary to evaluate the presence of potential impacted environmental media. This document presents the findings of a Focused Preliminary Assessment/Site Inspection (PA/SI) conducted within the CJCA, MCB CamLej, North Carolina.

The Focused PA/SI specifically addressed 4 areas of historical land use or waste disposal within the CJCA, including:

- Military Munitions Response Program Site Unexploded Ordnance (UXO)-20 (Former 1,000-inch Range and Former A-1 50-foot .22 Caliber Range)
- Solid Waste Management Unit (SWMU) 46/Installation Restoration (IR) Site 15-Former Montford Point Burn Dump
- SWMU 47/IR Site 17-Montford Point Area Rip Rap
- SWMU 241/IR Site 85-Former Camp Johnson Battery Dump

This Focused PA/SI was conducted by CH2M HILL under the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC) Comprehensive Long-Term Environmental Action Navy (CLEAN) 1000 Contract N62470-08-D-1000, Task Order 11 in accordance with the *Site-specific Work Plan Addendum for Focused Preliminary Assessment/Site Inspection– Camp Johnson MILCON Area, Marine Corps Base Camp Lejeune, North Carolina* (CH2M HILL, 2009). This report is for submittal to NAVFAC Mid-Atlantic, MCB CamLej, the U.S. Environmental Protection Agency (EPA), and the North Carolina Department of Environment and Natural Resources (NCDENR).

## 1.1 Objectives and Approach

The overall objective of this Focused PA/SI is to evaluate the potential presence and nature of environmental impacts within the boundaries of the CJCA and to evaluate whether the area is fit for MILCON.

Specifically, the objectives of the CJCA Focused PA/SI for each assessment area are listed below:

- UXO-20 Former 1,000-inch range (archive search report [ASR] #2.32) and Former A-1 50-foot .22 caliber range (ASR #2.87)—to assess the potential for soil and groundwater contamination resulting from the former range activities
- SWMU 46/IR Site 15 Former Montford Point Burn Dump—to assess the nature and extent of potential soil and groundwater contamination and address data gaps from previous investigation activities



- SWMU 47/IR Site 17 Montford Point Area Rip-Rap – to assess the potential for soil and groundwater contamination resulting from historical disposal activities
- SWMU241/IR Site 85 Former Camp Johnson Battery Dump – to assess the nature and extent of potential soil and groundwater contamination and address data gaps from previous investigation activities

The specific tasks completed to meet the stated objectives included:

- Identifying historical activities conducted within the CJCA that may have resulted in environmental impacts
- Collection of surface soil, subsurface soil, and groundwater samples from locations within UXO-20 and Sites 15, 17, and 85 for laboratory analysis
- Excavation of test pits at Sites 15 and 85
- Removal of discarded batteries from Site 85 for laboratory analysis and disposal
- Ecological and human health risk screenings using analytical data from various media collected from UXO-20 and Sites 15, 17, and 85.

## 1.2 Report Organization

This Focused PA/SI report contains the following sections:

- Section 1 - Introduction
- Section 2 – Site Background
- Section 3 – Physical Setting and Regional Hydrogeology
- Section 4 – Field Investigation Activities
- Section 5 – Field Investigation Results
- Section 6 – Human Health Risk Assessment
- Section 7 – Ecological Risk Assessment
- Section 8 – Conclusions
- Section 9 - References

Figures and tables are provided at the end of each respective section and appendices are provided at the end of Section 9.





#### Legend

- Camp Johnson Construction Area
- Installation Boundary

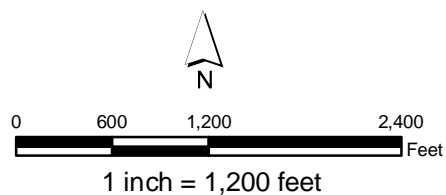


Figure 1-1  
Site Location Map  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina





# Site Background

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## 2.1 MCB CamLej Setting and History

MCB CamLej encompasses approximately 244 square miles of land in Onslow County, North Carolina, adjacent to the southern boundary of the city of Jacksonville. Jacksonville is the largest city near MCB CamLej and contains approximately half of the county's total population. Since 1990, much of the MCB CamLej complex has been part of Jacksonville.

MCB CamLej is bordered by the Atlantic Ocean to the east, U.S. Route 17 to the west and State Route 24 to the north. It is bisected by the New River, which flows into the Atlantic Ocean in a southeasterly direction. The MCB CamLej complex consists of multiple geographical locations under the jurisdiction of the Base command. These areas include Camp Geiger, Camp Johnson, Courthouse Bay, Stone Bay, Mainside, the Greater Sandy Run Area, and the Rifle Range Area.

MCB CamLej was placed on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) National Priorities List effective 4 November 1989. Subsequent to this listing, EPA Region IV, NCDENR, the United States Department of the Navy (Navy), and the Marine Corps entered into a Federal Facilities Agreement (FFA) for Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the Base are thoroughly investigated and that appropriate CERCLA response and Resource Conservation and Recovery Act (RCRA) corrective action alternatives are developed and implemented, as necessary, to protect public health and welfare and the environment.

## 2.2 Site Description and History

### 2.2.1 Site Description

The CJCA encompasses approximately 240 acres within Camp Johnson as shown on **Figure 2-1**. The CJCA is located on Hoover Road and is bounded by U.S. Highway 17 bypass to the north, the New River to the west, Montford Landing Road to the east, and Harding Road to the south.

Approximately 75 acres of the CJCA consists of the following former small arms ranges and firing points:

- Former 1,000-inch range (ASR #2.32)
- Former A-1 50-foot .22 caliber range (ASR #2.87), which appears as three separate range fans and firing points



Additionally, the CJCA also encompasses all or portions of the following former IR sites:

- SWMU 46/IR Site 15-Former Montford Point Burn Dump
- SWMU 47/IR Site 17-Montford Point Area Rip-Rap
- SWMU 241/IR Site 85-Former Camp Johnson Battery Dump

## 2.2.2 Site History

In October 2008, CH2M HILL completed a detailed historical review of information related to past uses of the CJCA. Information obtained from this review is presented in the Archival Records Search Report in **Appendix A**. Camp Johnson, formerly named Montford Point Camp, was the original training center for African-American Marines. Between 1941 and 1949 approximately 20,000 African-American Marines were trained at Montford Point. In 1949, the military was fully integrated and the area continued to be used for schools and training. Montford Point Camp was renamed Camp Johnson in 1974, and currently houses the Marine Corps Combat Service Support Schools (MCCSSS), which serve as training facilities for various duties within the Marine Corps. The MCCSSS consist of four military occupation skills schools, four tenant schools, and the Navy's Field Medical School. Approximately 10,000 students per year are trained at Camp Johnson.

### 1,000-inch Range (ASR #2.32)

The 1,000-inch Range at Camp Johnson operated from 1940 until the mid 1950s (**Figure 2-1**). Camp Training Order Number 5-1946 identified this range as a Familiarization Range for .30 caliber Browning automatic rifle and interviews with base personnel indicate the range was used for small arms (rifles from the M1 up to the Browning automatic rifle) (Richardson, 2008). Reference to the 1,000-inch Range was noted on the 1946 range overlay map (U.S. Army Corps of Engineers [USACE], 2001), which indicated the location of the firing position and direction of fire, but did not specify the range fan.

### A-1 50-foot .22 Range (ASR #2.87)

The former A-1 50-foot .22 Caliber Range appears on three range overlay maps (1951, 1953, and 1954) in varying shapes and locations (**Figure 2-1**). The range was reportedly used as a small arms firing range during the 1950s and is believed to have been inactive since 1957 (USACE, 2001). Although the name of the range suggests that .22-caliber weapons were used, the available documentation does not specify the type of small arms used on the range.

### IR Site 15

IR Site 15 (Site 15), formerly known as SWMU 46, is the former Montford Point Burn Dump (**Figure 2-1**). The site operated between 1946 and 1958 and was reportedly used to dispose sewage treatment sludge, litter, asphalt, and sand (CH2M HILL/ Baker Environmental, Inc. [Baker], 2005a). Site 15 currently consists of an open area surrounded by vegetation, and encompasses approximately 24 acres. However, historical investigations indicate that the former disposal area covered only roughly 2 acres in the eastern portion of the site.



### IR Site 17

IR Site 17 (Site 17) encompasses approximately 5 acres along the eastern shoreline of the New River and is covered by vegetation and concrete rip rap (**Figure 2-1**). Limited historical information is available for the site, which was originally evaluated during the Initial Assessment Study (WAR, 1983). Based on the results of that study, Site 17 was not considered for further investigation and no intrusive environmental investigations have historically been conducted at the site.

### IR Site 85

IR Site 85 (Site 85), the Former Camp Johnson Battery Dump, encompasses approximately 4.5 acres in the Camp Johnson support operations area of the Base (**Figure 2-1**) and was used as a battery dump during the 1950s. In 1992, decomposed batteries used in military communication equipment during the Korean War era were unearthed as a roadway was being widened. Military personnel using this area also discovered discarded charcoal canisters from air purifying respirators. The discarded battery packs and charcoal canisters were observed in piles randomly located throughout a 2 to 3-acre area. Investigations at Site 85 identified 16 battery piles across the site that ranged in size from 7 to 30 feet in diameter with heights of 1 to 3 feet.

## 2.3 Previous Investigations

### 2.3.1 IR Site 15

#### RCRA Facility Assessment

In January 1989, EPA Region IV and NCDENR conducted initial RCRA Facility Assessments (RFAs) of 76 SWMUs at MCB CamLej. SWMU 46 was identified as a site that required confirmatory sampling (Environmental Safety and Design, 1996).

#### Confirmatory Site Investigations

In 1997, Baker conducted a Phase I Confirmatory Site Investigation (CSI) (Baker, 2001) to evaluate whether material disposed of at the site during landfill operations or in the recent past had impacted surface and subsurface soils. Surface and subsurface soil samples were collected and analyzed for semi-volatile organic compounds (SVOCs) and RCRA metals. The analytical data indicated that the concentration of arsenic detected in a subsurface soil sample collected from SWMU46-ISO3 exceeded the NCDENR soil screening limits (SSLs), EPA Region IX preliminary remediation goals (PRGs) for residential land use, and Base background criteria. Additionally, the concentrations of cadmium and lead detected in a subsurface soil sample collected from SWMU46-ISO2 exceeded NCDENR SSLs, EPA residential PRGs, and Base background criteria (**Figure 2-2**). Based on these results, additional assessment was recommended.



In 2002, Baker conducted a Phase II CSI (Baker, 2002) to assess soil and groundwater impacts and to evaluate the horizontal and vertical extent of buried waste. Baker collected surface soil, subsurface soil, and groundwater samples from 6 locations. The concentration of mercury detected in the surface soil sample collected from SWMU46-TW01 exceeded NCDENR soil to groundwater screening criteria, EPA residential PRGs, and Base background criteria. Additionally, concentrations of chromium, lead, and silver detected in the surface soil sample collected from SWMU46-TW04 exceeded NCDENR soil to groundwater screening criteria, EPA residential PRGs, and Base background criteria.

The concentration of lead detected in the groundwater sample collected from SWMU46-TW06 exceeded the North Carolina Groundwater Quality Standard (NCGWQS). However, water quality monitoring conducted during the collection of this sample indicated the presence of very high turbidity (999 nephelometric turbidity units). No other metals were detected in the groundwater samples at concentrations exceeding the NCGWQS.

The Phase II CSI (Baker, 2002) also included a geophysical survey to assess the approximate extent of buried debris. **Figure 2-2** illustrates the distribution of electromagnetic anomalies within the boundary of the geophysical survey area, and shows the presence of a large continuous anomaly surrounded by smaller irregular anomalies.

### RCRA Facility Investigation

In 2004, Baker conducted a RCRA Facility Investigation (RFI) to further characterize SWMU 46 and necessity for future corrective action based on risks to human health and the environment (CH2M HILL/Baker, 2005a). Assessment activities included a supplemental geophysical survey, excavation of test trenches, collection of soil samples from the test trenches, collection of surface and subsurface soil samples, and the installation and sampling of one permanent monitoring well.

The additional geophysical survey was performed to assess the boundary of the buried waste. In order to truth the geophysical survey, several test trenches were advanced near the predicted horizontal limits of the buried waste (**Figure 2-2**). Potential landfill material such as glass, metal debris (car parts, bedsprings, cable, and conduit), ceramic, ash, and other burned debris were encountered in the test trenches. Confirmatory soil samples were collected from each test trench at depths ranging from 3 to 7 feet bgs.

Based on the analytical data, elevated concentrations of metals were detected in surface soil samples, particularly in soil mounds located in the southeast portion of the site. Additionally, elevated concentrations of metals, SVOCs, and pesticides were detected in subsurface soil samples collected from the test trenches (**Figure 2-2**). Specifically, concentrations of several pesticides, including 4,4-dichlorodiphenyldichloroethane (4,4-DDD), 4,4-dichlorodiphenyltrichloroethane (4,4-DDT), alpha-chlordane, and gamma-chlordane exceeded North Carolina soil to groundwater screening levels and EPA industrial PRGs. The pesticide concentrations detected in the test trench samples were collected from soils both in contact with the debris as well as adjacent to the debris; however, the highest concentrations were detected in soils collected from within the debris. Because the pesticides were detected in soils in contact with the debris as well as native soil, it is unclear if the concentrations are attributed to past disposal activities.



In order to confirm the previous detections of lead in the groundwater sample collected from temporary monitoring well SWMU46-TW06 during the CSI, a permanent monitoring well (SWMU46-MW01) was installed in approximately the same location as SMWU46-TW06. Laboratory analysis of a groundwater sample collected from SWMU46-MW01 did not detect COCs in excess of applicable criteria. Consequently, no further assessment of groundwater quality was performed.

A human health risk assessment (HHRA) indicated that an unacceptable hazard level was present for future construction workers due to exposure to chromium in surface and subsurface soil. In addition, the HHRA identified an elevated risk to future child residents due to exposure to chromium in soil and groundwater. It should be noted, however, that the concentration for chromium in groundwater used to calculate the risk was collected from a temporary monitoring well that exhibited high turbidity during sample collection. A high sediment content in the groundwater sample may bias the concentration higher as a result of metals adsorbing onto the sediment grains. No other risks were identified in the HHRA. An ecological risk assessment conducted for the RFI concluded that terrestrial receptors may be at risk due to exposure to metals in surface soils.

### **Additional Assessment Activities**

In 2006, CH2M HILL conducted additional soil assessment activities in support of an Interim Remedial Measures (IRM) removal action to remove impacted soil mounds and surface soils identified in the RFI (CH2M HILL, 2006). The investigation activities included the collection of soil samples from soil mounds and surface soil. These samples were analyzed for volatile organic compounds (VOCs), SVOCs, pesticides, polychlorinated biphenyls (PCBs), and RCRA metals. VOCs, SVOCs, and PCBs were either not detected or the concentrations were below the screening levels. Surface soils containing pesticides and metals that were identified for removal included SWMU46-SS01, SWMU46-SS02, and SWMU46-SS04. The soil mounds surrounding soil samples SWMU46-SM04, SWMU-SM06, and SWMU46-SM07 were identified for removal as shown in **Figure 2-2**.

### **Removal Action**

The IRM removal action was completed in March 2007, and included excavation of the soil mounds and surface soil areas to a depth of 1 ft bgs (Shaw, 2007). A total of 1,039 tons of soil were removed from the site and disposed at the MCB CamLej landfill. Confirmatory soil samples were collected from the excavated material and the results indicated that one composite soil sample (SWMU46-0005) was reported to contain a concentration of mercury (0.14 milligram per kilogram [mg/kg]) greater than the NC SSL (0.015 mg/kg); however, the concentration was only slightly greater than the Base background concentration (0.12 mg/kg), and no additional excavation was conducted. On December 28, 2007, following completion of the removal action, SWMU 46 was transferred to the Installation Restoration Program as Site 15.

## **2.3.2 IR Site 17**

No previous intrusive investigations have been conducted at Site 17.



### 2.3.3 IR Site 85

#### Pre-Remedial Investigation

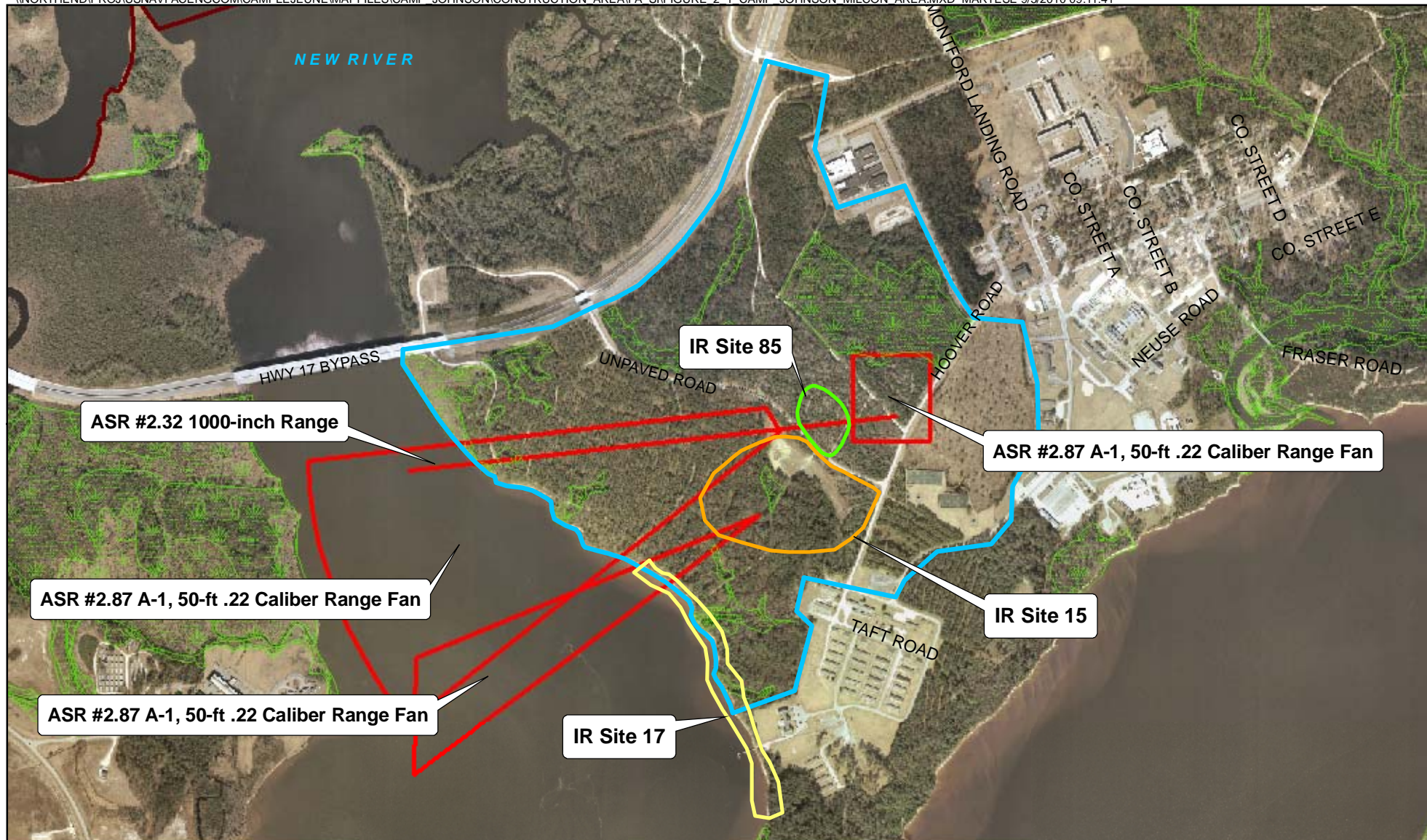
A Pre-Remedial Investigation (Pre-RI) screening study was conducted at Site 85 from 1995 to 1998 and included the collection of soil and groundwater samples for laboratory analysis of metals (Baker, 1998). Analytical data indicated the presence of elevated metals concentrations in surface and subsurface soils near the battery disposal piles (**Figure 2-3**). Metals were detected in all of the surface soil samples; however, only the sample collected from 85-SB02 exhibited concentrations that exceeded the NCDENR soil to groundwater screening levels and the EPA risk-based concentrations (RBCs) for residential soils. Metals were reportedly not detected at concentrations greater than the regulatory screening levels in the subsurface soil samples; however, concentrations of metals that exceeded twice the Base background level were detected in three subsurface soil samples (85-SB01, 85-SB02, and 85-SB03). Groundwater analytical data indicates concentrations of metals exceeded the regulatory screening levels that were in effect at the time of the investigation (**Figure 2-3**).

A baseline Risk assessment, completed as part of the Pre-RI, identified potential risks to current military personnel due to exposure to metals in surface soil. Potential risks due to exposure to surface soil and groundwater were also identified for future child and adult residents. As a result of the findings in the Pre-RI, it was recommended that an Engineering Evaluation/Cost Analysis (EE/CA) be completed to evaluate remedial alternatives for soil contamination at the site.

#### Non-time-critical Removal Action

The EE/CA (Baker, 1999) recommended removal of the soil and batteries through a non-time-critical removal action (NTCRA) followed by re-evaluation of site groundwater. The NTCRA was completed from October to December 1999, and included the excavation and removal of 158 tons of soil and debris from the 16 separate battery pile locations shown on **Figure 2-3** (OHM, 2000). Confirmatory soil samples were collected beneath each battery pile following excavation to confirm that the cleanup goals (EPA Region III Industrial Soil RBCs) were achieved. Following the NTCRA, five permanent groundwater monitoring wells were installed in the vicinity of the battery pile removal areas to monitor metals in the shallow groundwater. Five groundwater monitoring events were conducted from July 2001 through July 2002 and the results indicated that concentrations of metal were not detected above regulatory criteria. Consequently, the site was granted No Further Action (NFA) status in May 2005.





#### Legend

IR Site 15

IR Site 17

Camp Johnson Construction Area

IR Site 85

Wetlands

UXO-20

Installation Boundary



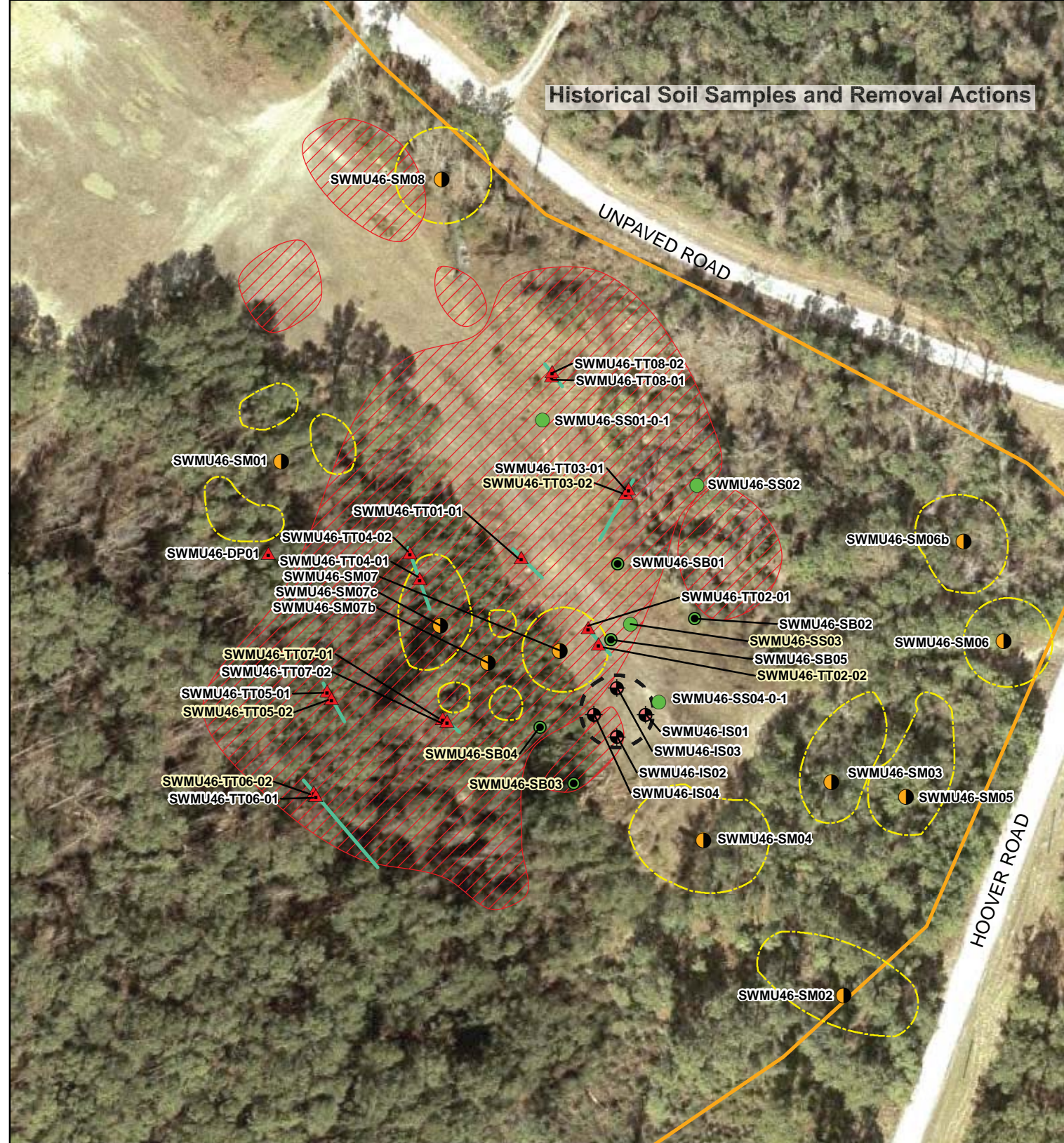
0 600 1,200 2,400  
Feet

1 inch = 1,200 feet

Figure 2-1  
UXO-20 and IR Site Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







# Legend

- Phase I CSI Soil Boring (Baker 1997)
- Phase II CSI Surface/Subsurface Soil/Groundwater Sample (Baker 2002)
- RFI Monitoring Well (Baker/CH2M HILL 2005)
- RFI Soil Boring (Baker/CH2M HILL 2005)
- ▲ RFI Test Trench Sample Location (Baker/CH2M HILL 2005)
- NTCRA Soil Mound Sample Location (CH2M HILL, 2006)
- NTCRA Surface Soil Sample Location (CH2M HILL 2006)
- Test Trench (Baker/CH2M HILL, 2005)
- - - Approximate location of former mounded material
- Soil Mounds
- ▨ Approximate Electromagnetic Geophysical Anomaly Area
- IR Site
- SWMU46-SB03 - Highlighted Sample Locations Exceeded Regulatory Criteria

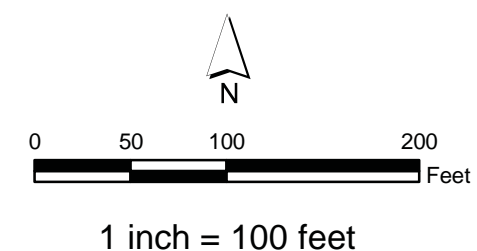
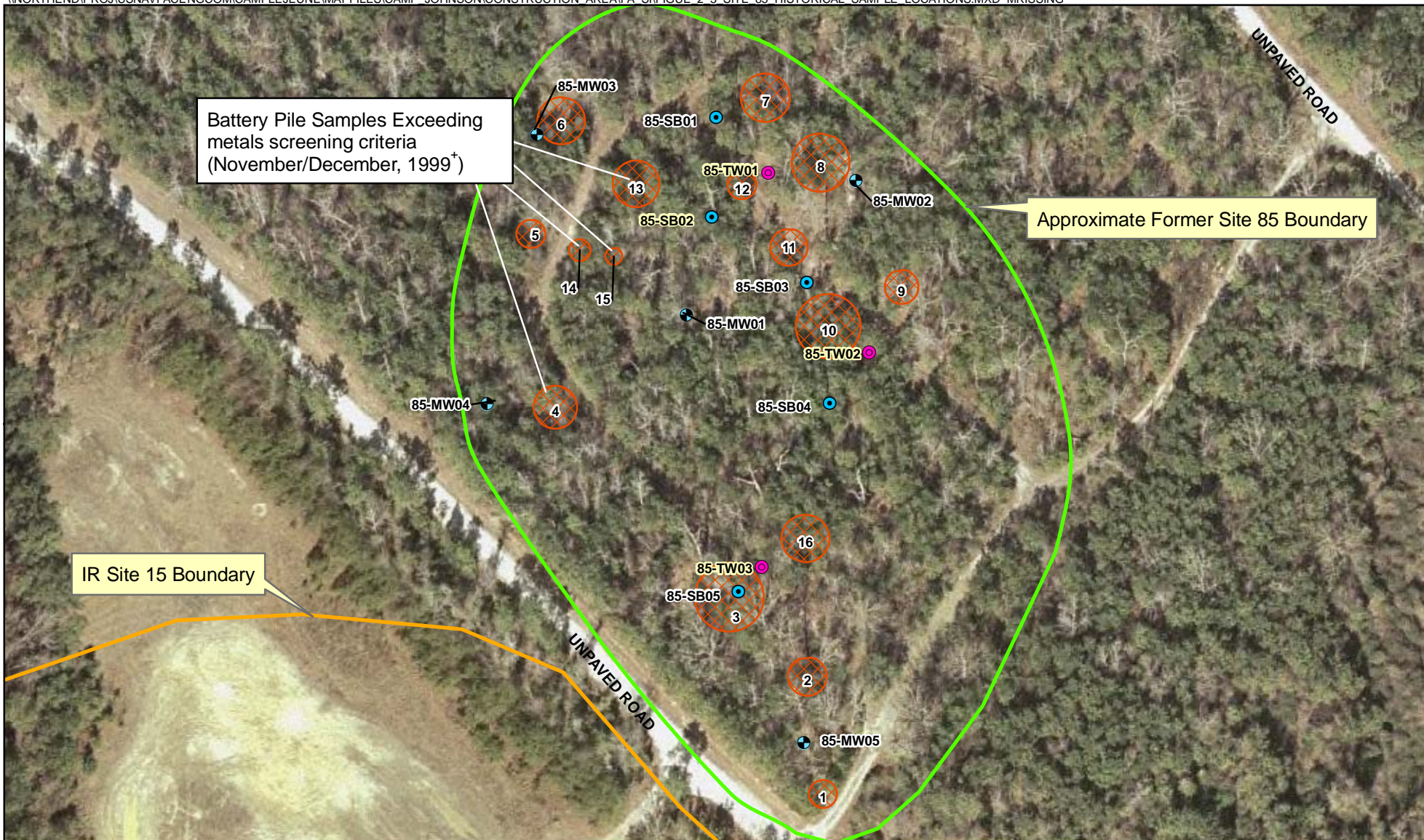


Figure 2-2  
Site 15 Historical Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina



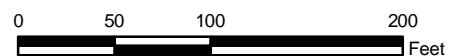




#### Legend

- Surface/Subsurface Soil Sample (Baker, 1998)
- Monitoring Well (CH2M HILL/Baker, 2005)
- Groundwater Sample (Baker, 1998)
- ⊗ Former Battery Pile Locations
- Approximate Former IR Site 85 Boundary
- IR Site 15 Boundary
- SWMU46-SB03** - Highlighted Sample Locations Exceeded Regulatory Criteria

+ Data obtained from Final Closeout Report (OHM, 2000)



1 inch = 100 feet

Figure 2-3  
Site 85 Historical Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina





# Physical Settings and Regional Hydrogeology

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## 3.1 Physical Setting and Regional Hydrogeology

The following sections describe the physical characteristics of the region, MCB CamLej, and the CJCA.

### 3.1.1 Regional and Facility-wide Physiography, Climate, and Surface Water Hydrology

The MCB CamLej facility lies within the Tidewater region of the Atlantic Coastal Plain Physiographic Province in North Carolina. This physiographic province stretches from Georgia to Long Island, New York. The Tidewater region is generally swampy and of low relief, with elevations averaging about 20 feet above mean sea level (amsl). The physiography of the area is typical of the Atlantic Coastal Plain with stepped terraces consisting of wide, gently eastward-sloping plains separated by linear, steeper, northward and eastward-facing scarps (**Figure 3-1**). Within MCB CamLej, the topography is characterized by low elevations and relatively low relief. The surface elevations at MCB CamLej range from sea level to approximately 70 feet amsl, with most of MCB CamLej's topography ranging from 20 to 40 feet amsl. The relief between stream and inter-stream areas typically ranges from 20 to 30 feet. The New River and its tributaries bisect the Base in a northwest to southeast alignment and the land at MCB CamLej generally slopes toward the New River with a grade of about 0.5 percent.

Mild winters and hot humid summers generally characterize climatic conditions within southeastern North Carolina and at MCB CamLej. Winters are usually short and mild with occasional short, cold periods. Summers are long, hot and humid. Average annual precipitation in the area is approximately 50 inches. The average ambient air temperature is 62 degrees Fahrenheit (weatherreports.com).

### 3.1.2 Site Topography, Drainage, and Surface Features

The CJCA is generally undeveloped with areas of dense vegetation and sporadic open areas. Additionally, several areas across the CJCA have been identified as wetlands or potential wetlands areas as shown on **Figure 2-1**. The surface topography slopes gently toward the southwest and the New River, ranging in elevation from roughly 5 to 20 ft amsl, as shown on **Figure 3-2**.

## 3.2 Geology and Hydrogeology

### 3.2.1 General Regional Geologic and Hydrogeologic Framework

MCB CamLej is underlain by an eastward thickening sediment wedge of marine and non-marine origins ranging in age from early Cretaceous to Holocene. The wedge of sediment begins at the western boundary of the Atlantic Coastal Plain physiographic province, known as the Fall Line, and dips southeastward towards the coast. Along the coastline,



several thousands of feet of interlayered, unconsolidated sediments are present consisting of gravel, sand, silt, clay deposits, calcareous clays, shell beds, sandstone and limestone that was deposited over pre-Cretaceous crystalline basement rock. Within the MCB CamLej area, approximately 1,500 feet of a sedimentary sequence overlies the crystalline basement rock. The geologic formations of southeastern North Carolina and MCB CamLej are presented in **Table 3-1**.

The sedimentary sequence of southeastern North Carolina includes seven aquifers and their associated confining units (less permeable beds of clay and silt) including the surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and Upper and Lower Cape Fear aquifers shown in **Table 3-1** (Cardinell et al., 1993). Inter-stream areas generally provide the recharge for aquifers within the Coastal Plain region, and have been estimated to have a yearly recharge range of 5 to 21 inches from infiltration of rainfall (Heath, 1989). In general, natural discharge of groundwater from the Coastal Plain aquifer system is into streams, swamps, and lakes. Evapotranspiration from the vadose zone and upward leakage through confining units into streams, estuaries, swamps, and even the ocean also contribute to groundwater discharge. Within the vicinity of MCB CamLej, the New River estuary serves as the principal discharge area for groundwater from the Castle Hayne aquifer (Harned, 1989).

### 3.2.2 Site-Specific Geologic and Hydrogeologic Framework

This section presents the geological and hydrogeological characteristics of the CJCA, as indicated by the intrusive sampling activities conducted during the Focused PA/SI.

#### Site Geology

The regional stratigraphic framework of the Lower Coastal Plain in North Carolina is summarized by **Table 3-1**. However, the lithology described in this section is limited to the undifferentiated formation as observed during the Focused PA/SI field activities.

Soil boring logs presented in **Appendix B** show that the shallow soils consist predominantly of fine grained sand with varying amounts of silt or clay. Discontinuous layers of fine grained clayey sands and sandy clays were observed to approximately 11 feet below ground surface (ft bgs). This clay layer was generally underlain by fine grained sands and silty sands to approximately 20 ft bgs.

#### Site Hydrogeology

Site-specific hydrogeologic information was derived from the temporary groundwater monitoring wells installed within the surficial aquifer. During the July 2009 PA/SI field investigation, groundwater elevations ranged from approximately 5 feet amsl to 28 ft amsl (**Table 3-2**). **Figure 3-7** illustrates the estimated groundwater flow direction within the surficial aquifer. The variability and heterogeneity of the shallow undifferentiated soils leads to localized recharge rates and variable water table elevations. Outlier groundwater elevations were not used in estimating the generalized groundwater flow direction. The figure indicates that shallow groundwater across the CJCA generally flows to the southwest, which generally follows the topography of the CJCA.



### 3.3 Regional Water Usage

Regionally in southeastern North Carolina, the Castle Hayne aquifer may be utilized as a potable source of domestic water supply, watering lawns, or filling swimming pools. Potable water supplies for MCB CamLej and the surrounding residential areas are provided by water supply wells that pump groundwater from the Castle Hayne aquifer. Although freshwater is present within the surficial, Castle Hayne, Beaufort, and Peedee aquifers, all of which are located below MCB CamLej, only the Castle Hayne aquifer is used by MCB CamLej as a water supply source (Cardinell et al., 1993).

**Figure 3-8** illustrates the locations of public water supply wells within a 4-mile radius of the CJCA, and shows that no wells are located within the CJCA boundary. Three wells were identified off Base north of U.S. Route 17 within a 4-mile radius of the CJCA (NC OneMap, 2009), and 30 water supply wells are located on Base within a 4-mile radius of the CJCA sites. Of the on-base wells, 19 are currently active, and serve the Camp Geiger, Marine Corps Air Station, Verona Loop, Hadnot Point and Holcomb Boulevard well fields, shown on **Table 3-3** and **Figure 3-8**. MCB CamLej controls all the land between the CJCA sites and associated groundwater discharge points.

According to the Wellhead Protection Plan, the CJCA is not located within a well head protection area (AH Environmental Consultants, 2002).



**TABLE 3-1**

Geologic and Hydrogeologic Units of the Inner Coastal Plain  
 Camp Johnson Construction Area  
*Focused PA/SI Report*  
*MCB CamLej, North Carolina*

Geologic Units			Hydrogeologic Units
System	Series	Formation	Aquifer and Confining Unit
Quaternary	Holocene	Undifferentiated	Surficial Aquifer
	Pleistocene		
	Pliocene	Yorktown Formation <sup>1</sup>	Yorktown confining unit <sup>1</sup> Yorktown Aquifer <sup>1</sup>
		Eastover Formation <sup>1</sup>	Yorktown Aquifer <sup>1</sup> Pungo River confining unit <sup>1</sup>
Tertiary	Miocene	Pungo River Formation <sup>1</sup>	Pungo River confining unit <sup>1</sup> Pungo River Aquifer <sup>1</sup>
		Belgrade Formation	Castle Hayne confining unit
	Oligocene	River Bend Formation	Castle Hayne Aquifer
	Eocene	Castle Hayne Formation	Castle Hayne Aquifer

**Notes:**

<sup>1</sup> Geologic and hydrogeologic units not present beneath MCB Camp Lejeune.

Source: Cardinell et al., 1993.

Created by: B. Propst/CLT

Checked by: K. Howell/CLT



**TABLE 3-2**

Summary of Well Construction Information  
 Camp Johnson Construction Area  
 Focused PA/SI Report  
 MCB CamLej, North Carolina

Well ID	Date	Screened Interval (ft)	Ground Elevation (ft msl)	DTW (ft btoc)	TOC Elevation (ft msl)	GW Elevation (ft msl)
CJCA - TW01	7/28/2009	8-18	19.70	16.27	21.70	5.43
CJCA - TW02	7/28/2009	8-18	18.27	9.46	20.19	10.73
CJCA - TW03	7/28/2009	10-20	19.01	15.92	19.57	3.65
CJCA - TW04	7/29/2009	6-16	22.62	12.08	23.58	11.50
CJCA - TW05	7/28/2009	13-23	20.10	16.35	21.24	4.89
CJCA - TW06	7/28/2009	6-16	17.61	13.81	18.56	4.75
CJCA - TW08	7/27/2009	8-18	12.93	11.25	14.47	3.22
CJCA - TW09	7/26/2009	6-16	14.03	11.01	15.27	4.26
CJCA - TW10	7/27/2009	2-12	25.63	4.41	26.77	22.36
CJCA - TW11	7/27/2009	8-18	13.41	9.46	14.70	5.24
CJCA - TW12	7/26/2009	8-18	14.97	11.30	16.26	4.96
CJCA - TW13	7/26/2009	5-15	12.27	7.69	13.64	5.95
CJCA - TW14	7/26/2009	10-20	15.07	10.67	15.71	5.04
CJCA - TW15	7/26/2009	8-18	17.32	11.81	18.55	6.74
CJCA - TW16	7/25/2009	7-17	11.61	10.42	12.23	1.81
CJCA - TW17	7/24/2009	8-18	8.23	11.41	9.57	-1.84
CJCA - TW18	7/26/2009	9-19	14.3	9.60	15.52	5.92
CJCA - TW19	7/26/2009	8-18	23.37	12.42	25.43	13.01
CJCA - TW20	7/26/2009	7-17	12.39	11.70	15.65	3.95
CJCA - TW21	7/26/2009	6-16	11.34	11.71	13.33	1.62
CJCA - TW22	7/24/2009	12-22	20.52	9.91	22.31	12.40
CJCA - TW23	7/23/2009	2-12	8.72	4.80	10.29	5.49
CJCA - TW24	7/27/2009	6-16	27.34	8.47	28.35	19.88
CJCA - TW25	7/27/2009	8-18	13.04	11.35	15.04	3.69
CJCA - TW26	7/27/2009	6-16	6.89	6.24	9.32	3.08
CJCA - TW27	7/23/2009	10-20	10.84	15.60	12.53	-3.07
CJCA - TW28	7/23/2009	2-12	2.89	4.96	4.73	-0.23
CJCA - TW29	7/25/2009	6-16	14.01	13.58	16.18	2.60
CJCA - TW30	7/25/2009	6-16	10.53	11.79	12.79	1.00
CJCA - TW31	7/23/2009	2-12	6.63	8.79	9.12	0.33
CJCA - TW32	7/25/2009	6-16	12.79	10.68	13.99	3.31
CJCA - TW33	7/25/2009	6-16	14.89	12.35	15.96	3.61
CJCA - TW34	7/25/2009	6-16	12.72	13.10	14.96	1.86
CJCA - TW35	7/22/2009	5-15	7.95	8.65	9.19	0.54
CJCA - TW36	7/22/2009	6-16	15.98	11.87	17.98	6.11
CJCA - TW37	7/22/2009	5-15	11.48	13.87	13.80	-0.07
CJCA - TW38	7/23/2009	10-20	4.94	5.61	6.70	1.09
IR15 - TW01	7/28/2009	10-20	15.94	12.79	16.49	3.70
IR15 - TW02	7/29/2009	10-20	15.02	14.47	15.66	1.19
IR15 - TW03	7/28/2009	8-18	15.91	15.92	17.45	1.53
IR15 - TW04	7/29/2009	8-18	15.31	11.20	17.11	5.91
IR15 - TW05	7/28/2009	6-16	12.32	8.39	12.91	4.52
IR17 - TW01	7/29/2009	6-16	6.63	10.88	7.40	-3.48
IR17 - TW02	7/29/2009	7-17	8.29	10.07	16.16	6.09
IR85 - MW01	7/23/2009	ND	NM	13.51	NM	--
IR85 - MW02	7/23/2009	ND	NM	15.26	NM	--
IR85 - MW04	7/22/2009	ND	NM	11.77	NM	--
IR85 - MW05	7/21/2009	ND	NM	ND	NM	--
IR85 - TW04	7/27/2009	10-20	17.72	14.65	20.48	5.83
IR85 - TW05	7/29/2009	10-20	17.30	15.67	19.89	4.22
IR85 - TW06	7/30/2009	6-16	14.32	10.22	15.00	4.78
IR85 - TW07	7/30/2009	7-17	14.80	11.90	16.55	4.65
IR85 - TW08	7/30/2009	8-18	16.14	12.52	17.74	5.22

**Notes:**

ND- no data available

NM - not measured



**TABLE 3-3**

Regional Water Supply Wells  
 Camp Johnson Construction Area  
 Focused PA/SI Report  
 MCB CamLej, North Carolina

Well ID	Status	Well Field	Year Drilled	Total Depth (ft)	Diameter (in)	Original Pump Rate (gpm)	Pump Rate 2001 (gpm)
PSW-TC502	Inactive	Camp Geiger	1942	184	10	400	235
PSW-TC600	Active	Camp Geiger	1942	70	8	130	104
PSW-TC604	Inactive	Camp Geiger	1942	113	8	250	157
PSW-TC700	Inactive	Camp Geiger	1941	76	18	125	149
PSW-TC1000	Inactive	Camp Geiger	1942	153	8	200	60
PSW-TC1001	Inactive	Camp Geiger	1975	100	8	175	160
PSW-TC1251	Active	Camp Geiger	1975	155	8	200	175
PSW-TC1253	Active	Camp Geiger	1975	250	NA	200	195
PSW-TC1254	Inactive	Camp Geiger	1975	195	NA	200	100
PSW-AS106	Inactive	MCAS	1954	179	NA	225	183
PSW-AS131	Inactive	MCAS	NA	200	NA	260	275
PSW-AS190	Active	MCAS	NA	180	NA	250	159
PSW-AS191	Active	MCAS	NA	180	NA	250	285
PSW-AS203	Inactive	MCAS	NA	173	NA	130	220
PSW-AS4140	Active	MCAS	NA	193	NA	110	110
PSW-AS4150	Active	MCAS	NA	193	NA	128	115
PSW-AS5001	Active	MCAS	NA	193	NA	185	50
PSW-AS5009	Inactive	MCAS	NA	196	NA	100	111
PSW-VL101	Active	Verona Loop	1994	300	8	950	700
PSW-VL102	Active	Verona Loop	1997	280	12	1001	850
PSW-HP622	Active	Hadnot Point	NA	227	NA	300	280
PSW-HP643	Active	Holcomb Boulevard	1971	240	10	260	146
PSW-HP644	Active	Holcomb Boulevard	1971	255	10	160	192
PSW-HP698	Active	Holcomb Boulevard	1985	124	10	250	170
PSW-HP699	Active	Holcomb Boulevard	1985	108	10	275	108
PSW-HP700	Active	Holcomb Boulevard	1985	130	10	275	100
PSW-HP701	Active	Holcomb Boulevard	1985	100	10	150	185
PSW-HP703	Active	Holcomb Boulevard	NA	NA	NA	275	190
PSW-HP704	Active	Holcomb Boulevard	1985	124	10	200	100
PSW-HP707	Inactive	Holcomb Boulevard	1986	130	NA	120	133
BA-1	Active	Off base	NA	NA	NA	NA	NA
BA-1A	Active	Off base	NA	NA	NA	NA	NA
BA-2	Active	Off base	NA	NA	NA	NA	NA

## Notes:

On-Base well data from: AH Environmental Consultants, 2002. *Wellhead Protection Plan, 2002 Update*.

Off-base well data from: Source Water Assessment Program accessible at [http://swap.den.enr.stste.nc.us/swap\\_app/newer.htm](http://swap.den.enr.stste.nc.us/swap_app/newer.htm)

MCAS - Marine Corps Air Station

NA - Not available

ft- feet

gpm - gallons per minute

in - inch



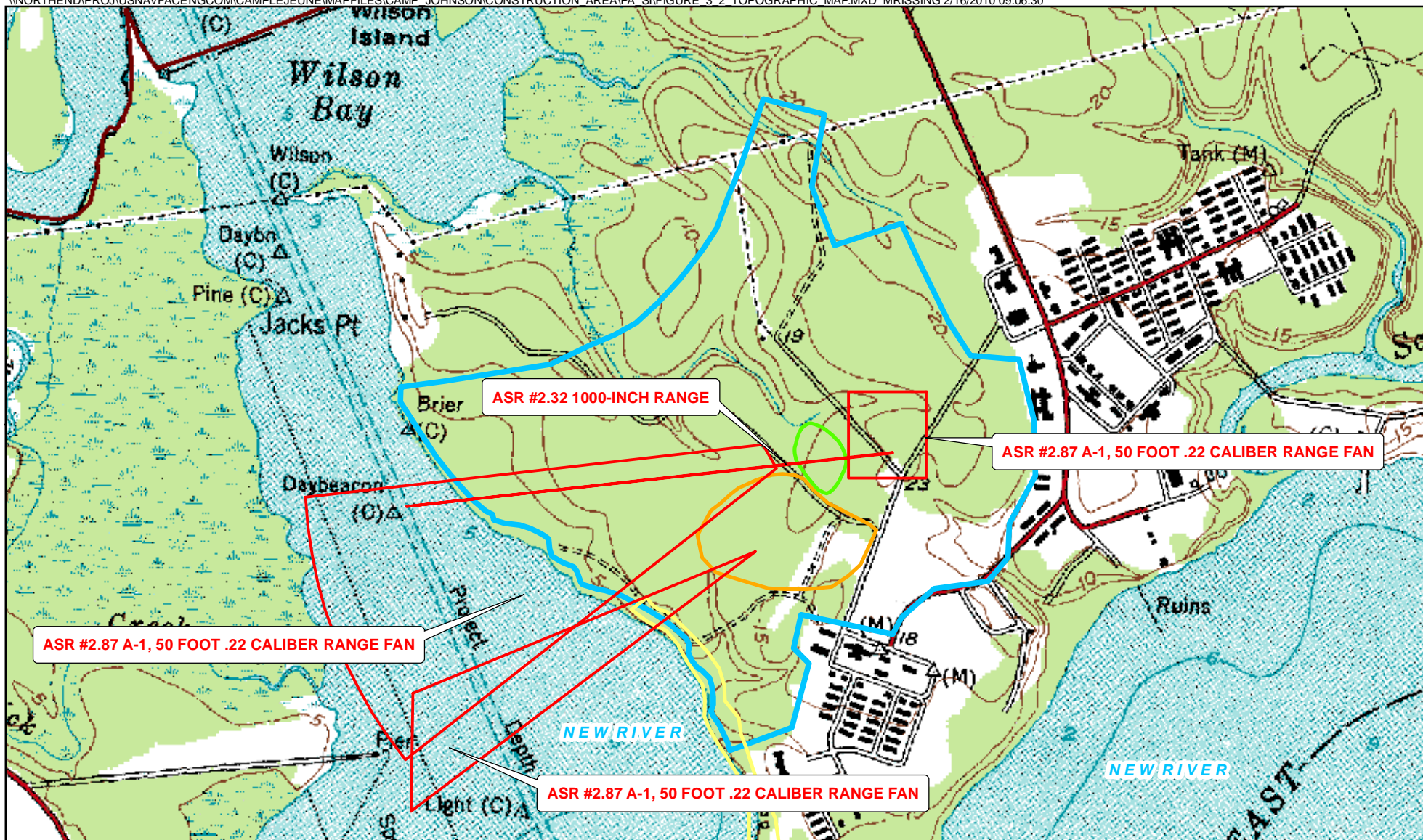


Source: USGS Report by Cardinell, A.P., S.A. Berg, and O.B. Lloyd, Jr. (1993)

Figure 3-1  
 Physiographic Provinces of Eastern North Carolina  
 Preliminary Assessment/Site Inspection  
 Camp Johnson Construction Area  
 MCB CamLej  
 North Carolina







#### Legend

- █ UXO-20
- █ Approximate Former Site 85 Boundary
- █ IR Site 17 Boundary
- █ IR Site 15 Boundary
- █ Camp Johnson Construction Area
- █ Installation Boundary

Note:  
Jacksonville South, NC NW/4 New River USGS 15-  
min Quadrangle, 1952 photoinspected 1988

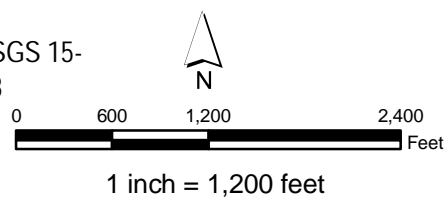
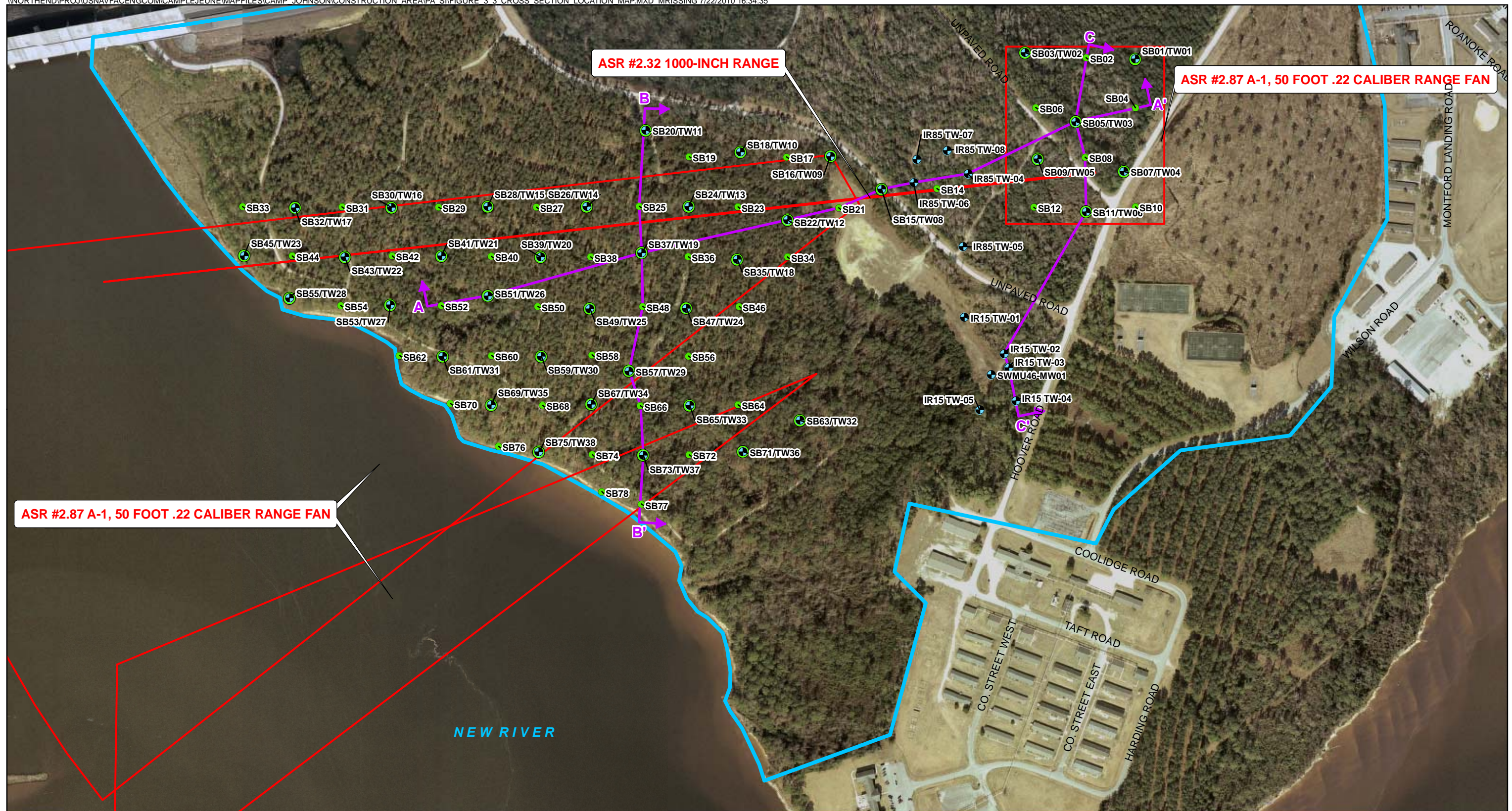


Figure 3-2  
Topographic Map  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







- Legend**
- Temporary Monitoring Well Locations
  - Subsurface Soil Sample Locations
  - Subsurface Soil and Groundwater Sample Locations
  - Geologic Cross Section
  - UXO-20
  - Camp Johnson Construction Area

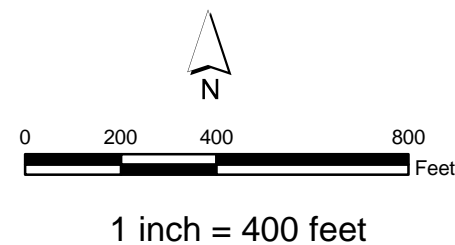
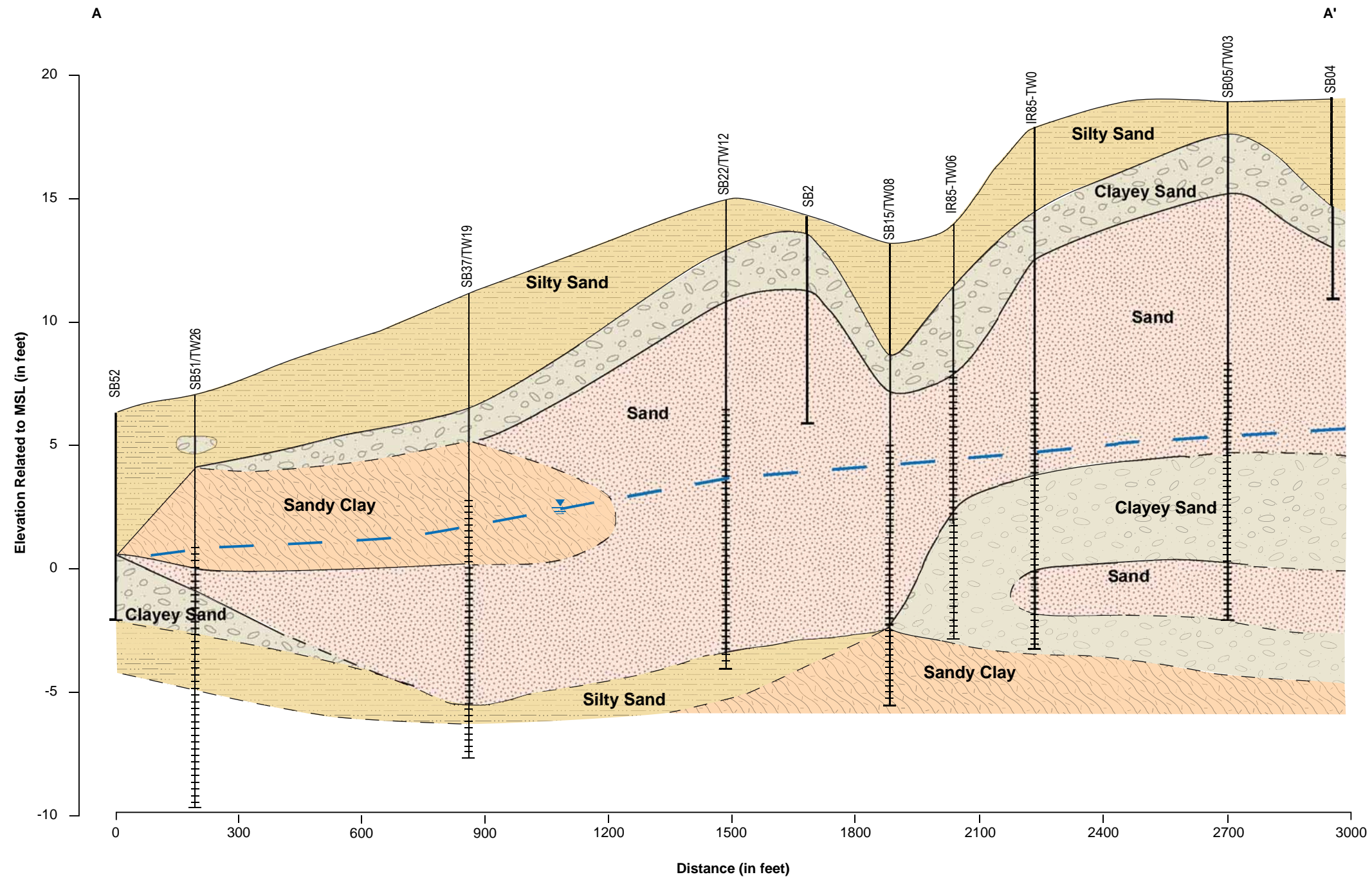


Figure 3-3  
Cross-Section Location Map  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







Horizontal : 1" = 300'  
Vertical: 1" = 5'  
V.E. = 60x

**LEGEND**

- Silty Sand
- Sandy Clay
- Clayey Sand
- Sand
- Soil Boring
- Screened Interval of Monitoring Well
- Water Level

**NOTE**

1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions at other locations may differ from conditions occurring at the indicated locations.

2) Groundsurface elevation at C/JCA-SB37/TW19 has been inferred based on the topographic map and ground elevations at C/JCA - SB22/TW12 and C/JCA - SB51/TW26.

Figure 3-4  
Cross Section (A-A')  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina





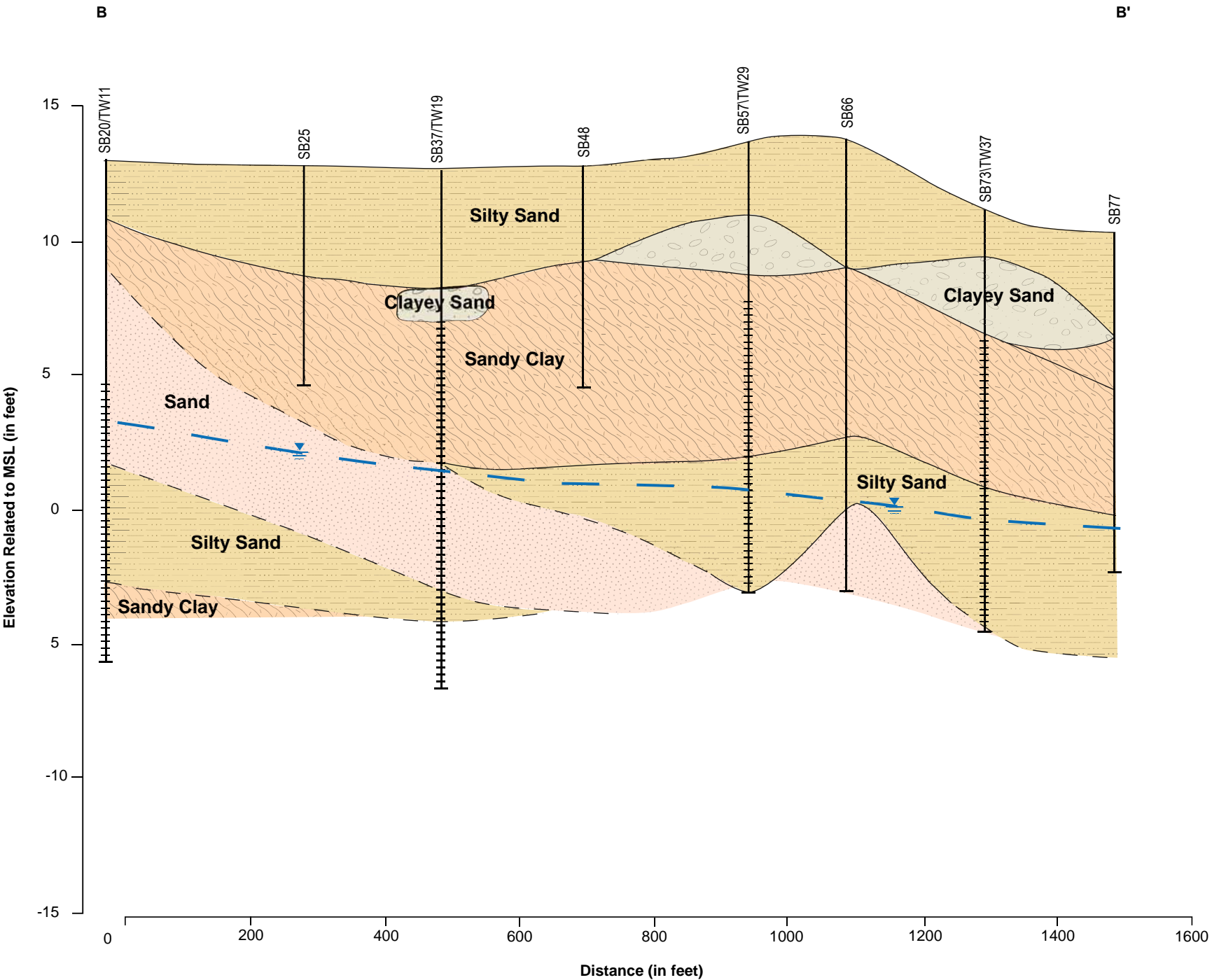
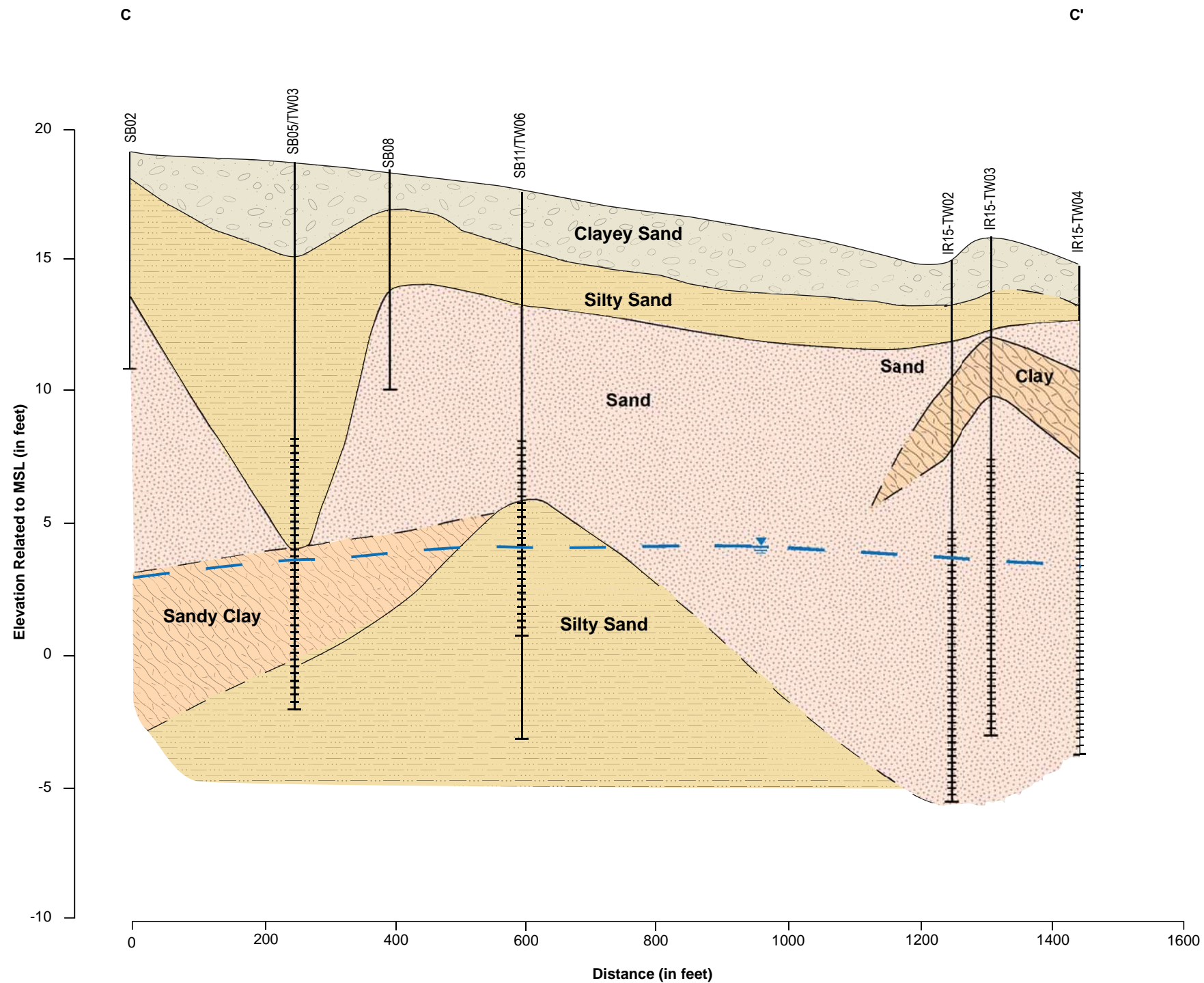


Figure 3-5  
Cross Section (B-B')  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







Horizontal : 1" = 200'  
Vertical: 1" = 5'  
V.E. = 40x

#### LEGEND

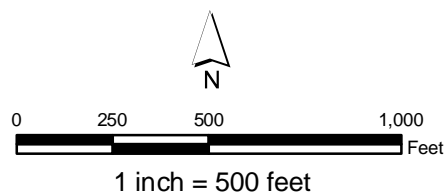
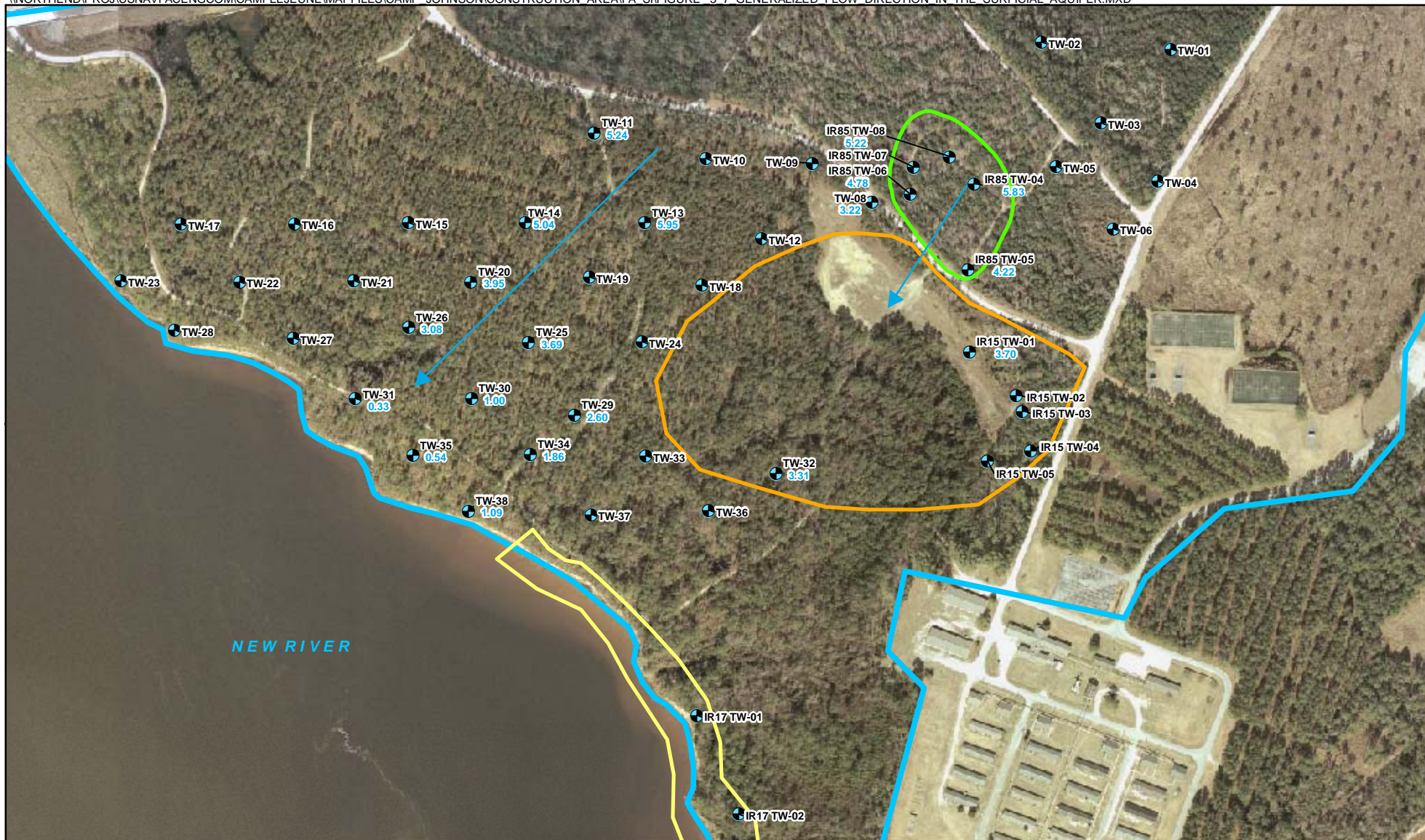
- Silty Sand
- Sandy Clay
- Clayey Sand
- Sand
- Soil Boring
- Screened Interval of Monitoring Well
- Water Level

**NOTE**  
1) The depth and thickness of the subsurface strata indicated on this section (profile) were generalized from and interpolated between test locations. Information on actual subsurface conditions apply only to the specific locations indicated. Subsurface conditions at other locations may differ from conditions occurring at the indicated locations.

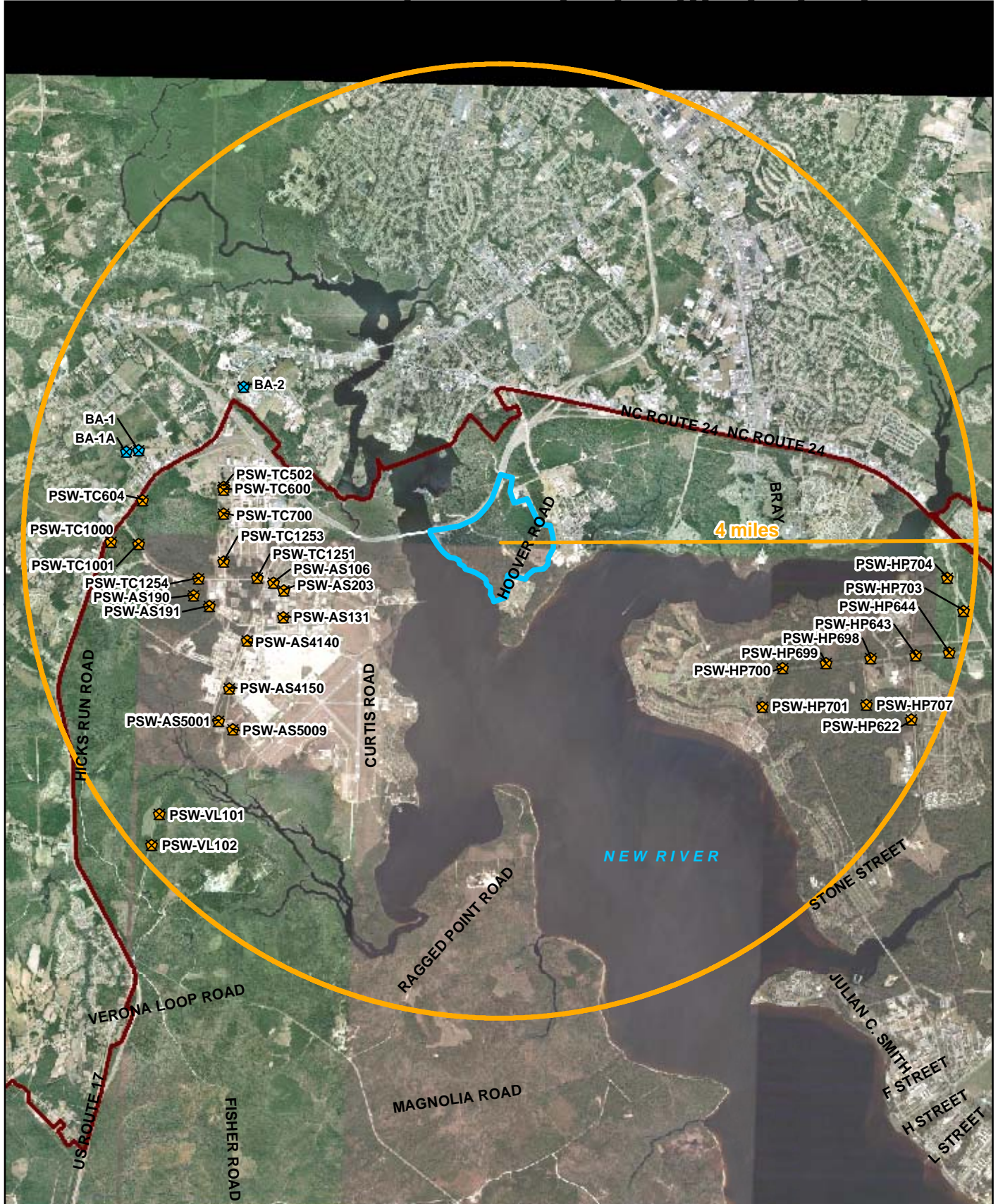
Figure 3-6  
Cross Section (C-C')  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina











#### Legend

- Public Water Supply Well
- Base Water Supply Well
- 4 Mile Radius
- Camp Johnson Construction Area
- Installation Boundary



0 3,000 6,000  
Feet

1 inch = 6,000 feet

Imagery Source: Google Earth Pro

Figure 3-8  
Water Supply Well Location Map  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina





# Field Investigation Activities and Data Evaluation

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## 4.1 Field Investigation Activities

Field activities were conducted in June and July 2009 in accordance with the standard operating procedures (SOPs) outlined in the work plan (CH2M HILL, 2009) and detailed in both the MMRP Master Project Plans (CH2M HILL, 2008a), and the Master Project Plans (CH2M HILL, 2008b).

The Focused PA/SI field activities consisted of the following:

- Site surveying
- Vegetation clearing
- Surface and subsurface soil sampling
- Installation and abandonment of temporary groundwater monitoring wells
- Groundwater sampling
- Test pit excavation

A summary of the environmental samples collected and sample analysis is provided in **Table 4-1**. Detailed investigation activities conducted at UXO-20 and IR Sites 15, 17, and 85 are summarized below.

### 4.1.1 Site Surveying

Land surveying activities were conducted by Lanier Surveying of Swansboro, North Carolina, a North Carolina-registered Land Surveyor, in June 2009. The land surveying was conducted in two phases:

- Phase 1 - Surveyed and marked the center points of the sampling grids, transects, and surface soil, subsurface soil, and groundwater sample locations;
- Phase 2 - Surveyed 50 temporary groundwater monitoring well top-of-casing elevations.

### 4.1.2 Vegetation Clearing

To facilitate access to the sampling and test pit locations, vegetation was removed along transects from approximately 10 acres of UXO-20 and approximately 2 acres in each of the IR sites. Vegetation less than 3 inches in diameter was cut to within 6 inches of the ground surface, mulched, and left in place. Trees larger than 3 inches in diameter were left undisturbed. All vegetation clearing was performed by Wetlands and Woodlands Management of Castle Hayne, North Carolina.

On June 17, 2009, during vegetation clearance activities near UXO-20, seven 4-inch canisters with black handles labeled "Grenade Hand - Sig Smoke, Green L68A1" were found by CH2M HILL personnel. The canisters appeared to be spent smoke grenades. After



evaluation of the canisters by CH2M HILL UXO technicians, it was determined that they did not pose a hazard to field personnel and were left in place. Avoidance practices were used for the remainder of the field effort and no additional items were observed.

### 4.1.3 Surface Soil Sampling

Surface soil sampling activities at the CJCA were conducted from July 6 through 10, 2009. The activities specific to the former ranges and IR sites are summarized below.

#### UXO-20

UXO-20 was divided into 1-acre grids in which three surface soil samples were collected using the TR-02-1 sampling method as summarized below and described in the United States Army Corps of Engineers (USACE) Technical Report ERDC/CRREL TR-02-1, *“Guide for Characterization of Sites Contaminated with Energetic Materials”* (Thiboutot, Ampleman, and Hewitt, 2002). A total of 214 surface soil samples were collected from UXO-20 (CJCA-SS01 through CJCA-SS214), as shown on **Figure 4-1**.

Each sample location was defined as 1 meter (m) × 1 m in size. Each surface soil sample was composed of a minimum of 30 aliquots of soil collected from 0 to 1 ft bgs from random locations within each 1 m × 1 m area. The soil samples were collected using a JMC Backsaver™ equipped with a 0.56-inch inner diameter sampling tube. The sample aliquots at each location were composited into a single sample following the *Homogenization of Soil and Sediment Samples* SOP in Appendix C of the MRP Master Project Plans (CH2M HILL, 2008a).

Following homogenization, the soil was transferred to the appropriate sample containers, placed on ice, and shipped under chain of custody via FedEx courier to GPL Laboratories of Frederick, Maryland, for analysis of the following parameters:

- Select metals – arsenic, antimony, copper, lead, and zinc (SW846 6010B/7471A)

Additionally, 32 surface soil samples (15 percent) collected from UXO-20 were analyzed for pH by SW846 9045C for geochemical evaluation purposes.

#### IR Sites 15, 17, and 85

**Figures 4-2** through **4-4** illustrate the locations of the surface soil samples collected from Sites 15, 17, and 85, respectively. The surface soil samples collected at each site included:

- Site 15- 10 surface soil samples
- Site 17 – 5 surface soil samples
- Site 85 – 13 surface soil samples

Surface soil samples at the three IR sites were obtained from a depth of 0 to 1 ft bgs using stainless steel trowels. A portion of each sample was split and field screened for the presence of VOCs using a flame-ionization detector (FID) and the presence of metals using a hand held x-ray fluorescence (XRF) instrument. An undisturbed portion of the sample was placed in VOC-specific Terra Core™ soil samplers with in-field preservation, of either sodium bicarbonate or methanol. The remaining sample was homogenized in a stainless steel bowl and placed in appropriate sample containers for the remaining analytes. The



samples were packed on ice and shipped under chain of custody via FedEx courier to GPL Laboratories of Frederick, Maryland, for analysis of the following parameters:

- Target compound list (TCL) VOCs (SW846 8260B)
- Total Metals (SW846 6010B/7470A)
- TCL SVOCs (SW846 8270C)
- Pesticides/PCBs (SW846 8081A/8082)
- pH (SW846 9045C)

#### 4.1.4 Subsurface Soil Sampling

A total of 104 subsurface soil samples were collected from direct-push technology (DPT) bore holes advanced in accordance with the *Direct-Push Soil Sample Collection* SOP in Section 3.4 of the Master Project Plans (CH2M HILL, 2008b). DPT drilling services were provided by South Atlantic Environmental Drilling and Construction Company (SAEDACCO), Inc. of Fort Mill, South Carolina. Prior to advancing the DPT soil borings, subsurface utilities were cleared to a minimum of 5 ft bgs using a hand auger. Continuous soil cores were collected from each boring and described using the Unified Soil Classification System. Soil boring logs are provided in **Appendix B**.

**Figures 4-2** through **4-5** illustrate the locations of subsurface soil samples collected at each site:

- UXO-20 – 77 subsurface soil samples
- Site 15 – 10 subsurface soil samples
- Site 17 – 5 subsurface soil samples
- Site 85 -12 subsurface soil samples

Soil boring CJCA-SB07 was not collected in lieu of an overlapping Site 85 soil boring. Each soil boring was screened for the presence of VOCs using an FID, and metals using a hand held XRF. Soil samples collected for laboratory analysis were selected from the depth that exhibited the greatest field screening reading within the interval of 2 to 7 ft bgs. If the FID and XRF screening did not indicate impacts within this zone, a composite sample of the entire interval was collected for analysis.

Subsurface soil samples collected within UXO-20 were analyzed by a fixed base laboratory for the following parameters:

- Select metals - arsenic, antimony, copper, lead, and zinc (SW846 6010B/7471A)

Additionally, 11 subsurface soil samples (15 percent) collected from UXO-20 were analyzed for pH by SW846 9045C for geochemical evaluation purposes.

Subsurface soil samples collected from Sites 15, 17, and 85 were analyzed by a fixed base laboratory for the following parameters:

- TCL VOCs (SW846 8260B)
- Total Metals (SW846 6010B/7470A)
- TCL SVOCs (SW846 8270C)
- Pesticides/PCBs (SW846 8081A/8082)
- pH (SW846 9045C)



### 4.1.5 Temporary Monitoring Well Installation

A total of 50 DPT boring locations were completed as temporary groundwater monitoring wells. Temporary well locations are shown by **Figures 4-2** through **4-5**, and included:

- UXO-20 – 38 temporary wells
- Site 15 – 5 temporary wells
- Site 85 – 5 temporary wells
- Site 17 – 2 temporary wells

The temporary monitoring wells were constructed using 1-inch inner diameter Schedule 40 polyvinyl chloride casing with 10 feet of 0.010-inch machine slotted well screen, equipped with a pre-packed sand filter. The screened interval of each temporary monitoring well was set to bracket the water table, at depths ranging from 13 to 20 ft bgs. A sand pack was placed around the well screen to approximately one ft above the top of the well screen and a bentonite seal was installed above the sand pack extending to ground surface. Well construction information is summarized in **Table 3-2**. Well construction diagrams are provided in **Appendix B**.

Following installation, the temporary monitoring wells were developed by surging and pumping until the water quality parameters stabilized. The wells were constructed, developed, and subsequently abandoned in accordance with *Temporary Well Installation SOP* in Section 3.6 of the Master Project Plans (CH2M HILL, 2008b).

### 4.1.6 Groundwater Sampling

Groundwater samples were collected from the 50 newly installed temporary monitoring wells and 4 of the existing permanent monitoring wells located at Site 85. Following well development, the 50 temporary monitoring wells were allowed to equilibrate for a period of at least 24 hours prior to collecting the groundwater sample. Depth-to-water measurements were collected from each well prior to purging and sampling using an electronic water level probe. Water level measurements are presented in **Table 3-2**.

All groundwater samples were collected using low-flow sampling techniques in accordance with the *Low-Flow Groundwater Sampling from Monitoring Wells SOP* in Section 3.11 of the Master Project Plans (CH2M HILL, 2008b). During purging, water quality parameters (conductivity, dissolved oxygen, pH, temperature, turbidity, and oxidation-reduction potential) were measured using a water quality meter. Groundwater samples were collected after water quality parameters had stabilized over consecutive readings and at least one well volume had been purged.

Parameters were considered stabilized when three successive readings were as follows:

- pH within 0.1 pH unit
- Temperature is stable
- Conductivity within 10 percent
- Oxidation-reduction potential within 10 millivolts
- Turbidity below 10 Nephelometric turbidity units

If water quality parameters did not stabilize, at least three well volumes were purged prior to sampling. If purging resulted in the well going dry, the well was allowed time to recharge



and the sample was collected. In wells in which at least three well volumes were purged and turbidity remained above 10 NTUs, groundwater samples were collected when turbidity measurements were as low as practicable. A summary of the water quality parameters are presented in **Table 4-2**.

Groundwater samples collected from UXO-20 were analyzed for the following parameters:

- Select Metals - arsenic, antimony, copper, lead, and zinc (SW846 6010B/7470A)
- Dissolved Metals- arsenic, antimony, copper, lead, and zinc (SW846 6010B/7470A) at wells located near the New River

Groundwater samples collected from Sites 15, 17, and 85 were analyzed for the following parameters:

- TCL VOCs (SW846 8260B)
- Total Metals (SW846 6010B/7470A)
- Dissolved Metals (SW846 6010B/7470A)
- TCL SVOCs (SW846 8270C)
- Pesticides/PCBs (SW846 8081A/8082)

All groundwater samples were collected in appropriately labeled containers, immediately packed on ice in coolers and shipped under chain-of-custody via FedEx courier to GPL Laboratories of Frederick, Maryland.

#### 4.1.7 Test Pits

A total of 12 test pits were excavated at Sites 15 and 85. The test pits were completed in accordance with Section 3.15, *Test Pits/Trenching*, of the Master Project Plans (CH2M HILL, 2008b). Following buried utility clearance, an excavator equipped with a 2-foot wide bucket was used to excavate a trench. The length and depth of each test pit varied based upon the transition from waste material (if encountered) to native soils. The test pits excavated at Site 15 ranged from 8 to 9 feet long and 5.5 to 7 feet deep. At Site 85, the test pits ranged from 3 to 13 feet long and 2 to 6 feet deep. The test pit excavations were completed by SAEDACOO, under direct supervision of a CH2M HILL geologist. The excavation was completed by removing lifts of no more than 12 inches at a time, until an assessment of the material could be made. The material removed from each pit was temporarily staged on 10-mil gauge plastic sheeting, described in accordance with the USCS, photographed, and screened for the presence of VOCs using an FID, and metals with a hand-held XRF.

**Appendix B** contains the test pit logs and digital imagery. Upon completion of the test pit activities, the excavated material was returned to the test pits.

##### Site 15

Eight test pits (IR15-TP01 through IR15-TP08) were excavated to depths ranging from 2 to 7 ft bgs to assess the boundaries of the former disposal area. The test pits were located near the approximate boundary of the geophysical survey in areas not previously delineated (**Figure 4-6**).

Several pieces of ceramic and a metal pipe were observed in IR15-TP04. Debris was not observed in remaining test pits and the test pit logs indicate the areas were composed of native material (**Figure 4-6**).



## Site 85

Four test pits (IR85-TP01 through IR85-TP04) were excavated to investigate for the presence of buried waste, including batteries (**Figure 4-7**). The depths of the test pits were generally 2 to 3 ft bgs, with a maximum depth of 6 ft bgs.

Batteries were noted on the ground surface at each test pit, but were not observed deeper than 2 ft bgs. The batteries matched the description of those historically disposed of at Site 85. A representative sample of the batteries (IR85-BAT) was collected and shipped to GPL for analysis of target analyte list (TAL) metals. When encountered, the batteries were separated from the excavated soils and placed in a 55-gallon drum for disposal. The soils were contained separately in 55-gallon drums. No other debris was encountered in the Site 85 test pits.

### 4.1.8 Quality Assurance/Quality Control Sampling

Quality assurance/quality control (QA/QC) samples were collected in the same types of preserved containers as the field samples. QA/QC requirements for environmental sampling, handling, and management are detailed in Section 3.18 of the Master Project Plans. Field QC samples, including field blanks, equipment blanks, duplicate samples, and matrix spike/matrix spike duplicate samples, were collected during the investigation and submitted for laboratory analysis. QC samples were collected at the following rates.

- One matrix spike/matrix spike duplicate per 20 samples collected
- One duplicate per 10 samples collected
- One equipment blank per day per media
- One trip blank per cooler containing bottleware for VOC analysis
- One field blank per week

## 4.2 Data Tracking and Validation

Field samples and their corresponding analytical tests were recorded on chain-of-custody (COC) forms, which were submitted with the samples to the laboratory. COC entries were checked against the *Work Plan* (CH2M HILL, 2009) to verify all designated samples were collected and submitted for the appropriate analyses. Upon receipt of the samples by the laboratories, a comparison to the field information was made to verify that each sample was analyzed for the correct parameters. In addition, a check was made to ensure that the proper number and types of QA/QC samples were collected. Analytical data reports, in hard copy and electronic format, were submitted for third-party validation using the *National Functional Guidelines for Superfund for Organic Methods Data Review* (EPA, 2008), and *National Functional Guidelines for Inorganic Data Review* (EPA, 2004). The electronic data was downloaded into a CH2M HILL database. These steps (third-party validation and electronic data handling) serve to reduce inherent uncertainties associated with data authenticity and usability.

## 4.3 Investigation-Derived Waste Management

Investigation-derived waste (IDW) generated during the investigation was managed in accordance with Section 3.17 of the Master Project Plans. IDW included soil, liquid waste (e.g., purged groundwater or decontamination fluids), batteries, and personal protective



equipment (PPE). Soil and liquids were placed in DOT-approved 55-gallon drums, labeled, and staged for disposal. Samples were collected from the drummed IDW for characterization purposes. **Appendix C** contains the waste manifests for disposal of the batteries, soil and groundwater IDW generated during this investigation. Used PPE and trash were placed into opaque garbage bags and placed in an onsite dumpster.



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
Camp Johnson Construction Area Groundwater											
CJCA-TW01	CJCA-TW01-09C			X	X					28-Jul-09	N
CJCA-TW02	CJCA-TW02-09C			X						28-Jul-09	N
CJCA-TW02	CJCA-TW02-09C-MS			X						28-Jul-09	MS
CJCA-TW02	CJCA-TW02-09C-SD			X						28-Jul-09	SD
CJCA-TW03	CJCA-TW03-09C			X	X					28-Jul-09	N
CJCA-TW04	CJCA-TW04-09C			X						29-Jul-09	N
CJCA-TW04	CJCA-TW04-09C-MS			X						29-Jul-09	MS
CJCA-TW04	CJCA-TW04-09C-SD			X						29-Jul-09	SD
CJCA-TW05	CJCA-TW05-09C			X						28-Jul-09	N
CJCA-TW06	CJCA-TW06-09C			X						28-Jul-09	N
CJCA-TW08	CJCA-TW08-09C			X						27-Jul-09	N
CJCA-TW09	CJCA-TW09-09C			X						26-Jul-09	N
CJCA-TW10	CJCA-TW10-09C			X						27-Jul-09	N
CJCA-TW11	CJCA-TW11-09C			X						27-Jul-09	N
CJCA-TW12	CJCA-TW12-09C			X						26-Jul-09	N
CJCA-TW13	CJCA-TW13-09C			X						26-Jul-09	N
CJCA-TW14	CJCA-TW14-09C			X						26-Jul-09	N
CJCA-TW15	CJCA-TW15-09C			X						26-Jul-09	N
CJCA-TW15	CJCA-TW15D-09C			X						26-Jul-09	FD
CJCA-TW16	CJCA-TW16-09C			X						25-Jul-09	N
CJCA-TW17	CJCA-TW17-09C			X	X					24-Jul-09	N
CJCA-TW18	CJCA-TW18-09C			X						26-Jul-09	N
CJCA-TW19	CJCA-TW19-09C			X						26-Jul-09	N
CJCA-TW20	CJCA-TW20-09C			X						26-Jul-09	N
CJCA-TW21	CJCA-TW21-09C			X						26-Jul-09	N
CJCA-TW22	CJCA-TW22-09C			X	X					24-Jul-09	N
CJCA-TW23	CJCA-TW23-09C			X	X					23-Jul-09	N
CJCA-TW24	CJCA-TW24-09C			X						27-Jul-09	N
CJCA-TW24	CJCA-TW24D-09C			X						27-Jul-09	FD
CJCA-TW25	CJCA-TW25-09C			X						27-Jul-09	N
CJCA-TW26	CJCA-TW26-09C			X						27-Jul-09	N
CJCA-TW27	CJCA-TW27-09C			X	X					23-Jul-09	N
CJCA-TW28	CJCA-TW28-09C			X	X					23-Jul-09	N
CJCA-TW29	CJCA-TW29-09C			X						25-Jul-09	N
CJCA-TW29	CJCA-TW29-09C-MS			X						25-Jul-09	MS
CJCA-TW29	CJCA-TW29-09C-SD			X						25-Jul-09	SD
CJCA-TW30	CJCA-TW30-09C			X						25-Jul-09	N
CJCA-TW31	CJCA-TW31-09C			X	X					23-Jul-09	N
CJCA-TW32	CJCA-TW32-09C			X						25-Jul-09	N
CJCA-TW33	CJCA-TW33-09C			X						25-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-TW34	CJCA-TW34-09C			X						25-Jul-09	N
CJCA-TW35	CJCA-TW35-09C			X	X					22-Jul-09	N
CJCA-TW35	CJCA-TW35D-09C			X	X					22-Jul-09	FD
CJCA-TW36	CJCA-TW36-09C			X	X					22-Jul-09	N
CJCA-TW37	CJCA-TW37-09C			X	X					22-Jul-09	N
CJCA-TW38	CJCA-TW38-09C	X	X							23-Jul-09	N
CJCA-TW38	CJCA-TW38-09C-MS	X	X							23-Jul-09	MS
CJCA-TW38	CJCA-TW38-09C-SD	X	X							23-Jul-09	SD
Camp Johnson Construction Area Subsurface Soil											
CJCA-SB01	CJCA-SB01-2-7-09C			X						26-Jul-09	N
CJCA-SB02	CJCA-SB02-2-6-09C			X						29-Jul-09	N
CJCA-SB02	CJCA-SB02-2-6-09C-MS			X						29-Jul-09	MS
CJCA-SB02	CJCA-SB02-2-6-09C-SD			X						29-Jul-09	SD
CJCA-SB03	CJCA-SB03-2-7-09C			X		X				26-Jul-09	N
CJCA-SB04	CJCA-SB04-4-7-09C			X						29-Jul-09	N
CJCA-SB05	CJCA-SB05-2-7-09C			X						26-Jul-09	N
CJCA-SB06	CJCA-SB06-2-7-09C			X						29-Jul-09	N
CJCA-SB07	CJCA-SB07-4-7-09C			X						26-Jul-09	N
CJCA-SB08	CJCA-SB08-2-7-09C			X						29-Jul-09	N
CJCA-SB09	CJCA-SB09-2-4-09C			X						26-Jul-09	N
CJCA-SB09	CJCA-SB09D-2-4-09C			X						26-Jul-09	FD
CJCA-SB10	CJCA-SB10-2-6-09C			X						28-Jul-09	N
CJCA-SB11	CJCA-SB11-2-7-09C			X		X				26-Jul-09	N
CJCA-SB12	CJCA-SB12-2-7-09C			X						29-Jul-09	N
CJCA-SB13	CJCA-SB13-2-7-09C			X						26-Jul-09	N
CJCA-SB13	CJCA-SB13-2-7-09C-MS			X						26-Jul-09	MS
CJCA-SB13	CJCA-SB13-2-7-09C-SD			X						26-Jul-09	SD
CJCA-SB14	CJCA-SB14-2-7-09C			X						28-Jul-09	N
CJCA-SB15	CJCA-SB15-6-7-09C			X						25-Jul-09	N
CJCA-SB16	CJCA-SB16-2-7-09C			X						25-Jul-09	N
CJCA-SB18	CJCA-SB18-2-5-09C			X		X				25-Jul-09	N
CJCA-SB19	CJCA-SB19-2-7-09C			X						28-Jul-09	N
CJCA-SB20	CJCA-SB20-2-7-09C			X						25-Jul-09	N
CJCA-SB20	CJCA-SB20D-2-7-09C			X						25-Jul-09	FD
CJCA-SB21	CJCA-SB21-2-7-09C			X						28-Jul-09	N
CJCA-SB22	CJCA-SB22-4-7-09C			X						25-Jul-09	N
CJCA-SB23	CJCA-SB23-2-3-09C			X						28-Jul-09	N
CJCA-SB24	CJCA-SB24-2-4-09C			X						24-Jul-09	N
CJCA-SB25	CJCA-SB25-6-7-09C			X						28-Jul-09	N
CJCA-SB26	CJCA-SB26-4-7-09C			X						23-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SB27	CJCA-SB27-4-7-09C			X						28-Jul-09	N
CJCA-SB28	CJCA-SB28-2-4-09C			X						23-Jul-09	N
CJCA-SB29	CJCA-SB29-2-7-09C			X		X				28-Jul-09	N
CJCA-SB30	CJCA-SB30-2-7-09C			X						23-Jul-09	N
CJCA-SB31	CJCA-SB31-4-7-09C			X						23-Jul-09	N
CJCA-SB31	CJCA-SB31D-4-7-09C			X						23-Jul-09	FD
CJCA-SB32	CJCA-SB32-2-7-09C			X						22-Jul-09	N
CJCA-SB33	CJCA-SB33-4-6-09C			X						23-Jul-09	N
CJCA-SB34	CJCA-SB34-2-4-09C			X						28-Jul-09	N
CJCA-SB35	CJCA-SB35-2-4-09C			X						25-Jul-09	N
CJCA-SB35	CJCA-SB35-2-4-09C-MS			X						25-Jul-09	MS
CJCA-SB35	CJCA-SB35-2-4-09C-SD			X						25-Jul-09	SD
CJCA-SB36	CJCA-SB36-4-7-09C			X						28-Jul-09	N
CJCA-SB37	CJCA-SB37-6-7-09C			X						24-Jul-09	N
CJCA-SB38	CJCA-SB38-2-4-09C			X						24-Jul-09	N
CJCA-SB39	CJCA-SB39-2-4-09C			X						23-Jul-09	N
CJCA-SB40	CJCA-SB40-4-7-09C			X		X				28-Jul-09	N
CJCA-SB41	CJCA-SB41-4-6-09C			X						23-Jul-09	N
CJCA-SB42	CJCA-SB42-2-7-09C			X						28-Jul-09	N
CJCA-SB43	CJCA-SB43-6-7-09C			X						22-Jul-09	N
CJCA-SB44	CJCA-SB44-6-7-09C			X						23-Jul-09	N
CJCA-SB45	CJCA-SB45-2-5-09C			X						22-Jul-09	N
CJCA-SB45	CJCA-SB45D-2-5-09C			X						22-Jul-09	FD
CJCA-SB46	CJCA-SB46-4-7-09C			X						27-Jul-09	N
CJCA-SB46	CJCA-SB46-4-7-09C-MS			X						27-Jul-09	MS
CJCA-SB46	CJCA-SB46-4-7-09C-SD			X						27-Jul-09	SD
CJCA-SB47	CJCA-SB47-6-7-09C			X						25-Jul-09	N
CJCA-SB48	CJCA-SB48-4-6-09C			X		X				27-Jul-09	N
CJCA-SB49	CJCA-SB49-2-4-09C			X						25-Jul-09	N
CJCA-SB50	CJCA-SB50-4-6-09C			X						27-Jul-09	N
CJCA-SB50	CJCA-SB50D-4-6-09C			X						27-Jul-09	FD
CJCA-SB51	CJCA-SB51-2-7-09C			X						25-Jul-09	N
CJCA-SB52	CJCA-SB52-4-6-09C			X						27-Jul-09	N
CJCA-SB53	CJCA-SB53-2-7-09C			X		X				22-Jul-09	N
CJCA-SB54	CJCA-SB54-6-7-09C			X						22-Jul-09	N
CJCA-SB54	CJCA-SB54-6-7-09C-MS			X						22-Jul-09	MS
CJCA-SB54	CJCA-SB54-6-7-09C-SD			X						22-Jul-09	SD
CJCA-SB55	CJCA-SB55-4-6-09C			X						22-Jul-09	N
CJCA-SB56	CJCA-SB56-2-7-09C			X						27-Jul-09	N
CJCA-SB57	CJCA-SB57-2-4-09C			X						23-Jul-09	N

Notes:  
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FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SB58	CJCA-SB58-2-6-09C			X		X				27-Jul-09	N
CJCA-SB59	CJCA-SB59-2-4-09C			X						23-Jul-09	N
CJCA-SB59	CJCA-SB59D-2-4-09C			X						23-Jul-09	FD
CJCA-SB60	CJCA-SB60-4-6-09C			X						22-Jul-09	N
CJCA-SB61	CJCA-SB61-2-4-09C			X						22-Jul-09	N
CJCA-SB62	CJCA-SB62-2-4-09C			X						22-Jul-09	N
CJCA-SB63	CJCA-SB63-2-4-09C			X						23-Jul-09	N
CJCA-SB64	CJCA-SB64-4-7-09C			X						27-Jul-09	N
CJCA-SB64	CJCA-SB64D-4-7-09C			X						27-Jul-09	FD
CJCA-SB65	CJCA-SB65-2-4-09C			X						22-Jul-09	N
CJCA-SB65	CJCA-SB65-2-4-09C-MS			X						22-Jul-09	MS
CJCA-SB65	CJCA-SB65-2-4-09C-SD			X						22-Jul-09	SD
CJCA-SB66	CJCA-SB66-4-6-09C			X						22-Jul-09	N
CJCA-SB67	CJCA-SB67-6-7-09C			X		X				22-Jul-09	N
CJCA-SB68	CJCA-SB68-4-6-09C			X						22-Jul-09	N
CJCA-SB69	CJCA-SB69-6-7-09C			X						21-Jul-09	N
CJCA-SB70	CJCA-SB70-4-6-09C			X						22-Jul-09	N
CJCA-SB70	CJCA-SB70D-4-6-09C			X						22-Jul-09	FD
CJCA-SB71	CJCA-SB71-6-7-09C			X						21-Jul-09	N
CJCA-SB72	CJCA-SB72-4-6-09C			X						21-Jul-09	N
CJCA-SB73	CJCA-SB73-4-6-09C			X		X				21-Jul-09	N
CJCA-SB74	CJCA-SB74-2-7-09C			X						21-Jul-09	N
CJCA-SB75	CJCA-SB75-4-6-09C			X						21-Jul-09	N
CJCA-SB76	CJCA-SB76-4-6-09C			X						21-Jul-09	N
CJCA-SB77	CJCA-SB77-2-4-09C			X						21-Jul-09	N
CJCA-SB78	CJCA-SB78-4-6-09C			X						21-Jul-09	N
Camp Johnson Construction Area Surface Soil											
CJCA-SS001	CJCA-SS001-09C			X		X				7-Jul-09	N
CJCA-SS002	CJCA-SS002-09C			X						7-Jul-09	N
CJCA-SS003	CJCA-SS003-09C			X						7-Jul-09	N
CJCA-SS004	CJCA-SS004-09C			X		X				7-Jul-09	N
CJCA-SS005	CJCA-SS005-09C			X						7-Jul-09	N
CJCA-SS006	CJCA-SS006-09C			X						7-Jul-09	N
CJCA-SS007	CJCA-SS007-09C			X						7-Jul-09	N
CJCA-SS008	CJCA-SS008-09C			X		X				7-Jul-09	N
CJCA-SS009	CJCA-SS009-09C			X						7-Jul-09	N
CJCA-SS010	CJCA-SS010-09C			X						7-Jul-09	N
CJCA-SS011	CJCA-SS011-09C			X		X				7-Jul-09	N
CJCA-SS012	CJCA-SS012-09C			X						7-Jul-09	N
CJCA-SS013	CJCA-SS013-09C			X						7-Jul-09	N
CJCA-SS014	CJCA-SS014-09C			X						7-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS015	CJCA-SS015-09C			X		X				7-Jul-09	N
CJCA-SS016	CJCA-SS016-09C			X						7-Jul-09	N
CJCA-SS017	CJCA-SS017-09C			X						7-Jul-09	N
CJCA-SS018	CJCA-SS018-09C			X						7-Jul-09	N
CJCA-SS019	CJCA-SS019-09C			X		X				7-Jul-09	N
CJCA-SS020	CJCA-SS020-09C			X						7-Jul-09	N
CJCA-SS021	CJCA-SS021-09C			X						7-Jul-09	N
CJCA-SS021	CJCA-SS021D-09C			X						7-Jul-09	FD
CJCA-SS022	CJCA-SS022-09C			X						7-Jul-09	N
CJCA-SS023	CJCA-SS023-09C			X						7-Jul-09	N
CJCA-SS023	CJCA-SS023-09C-MS			X						7-Jul-09	MS
CJCA-SS023	CJCA-SS023-09C-SD			X						7-Jul-09	SD
CJCA-SS024	CJCA-SS024-09C			X		X				8-Jul-09	N
CJCA-SS025	CJCA-SS025-09C			X						7-Jul-09	N
CJCA-SS026	CJCA-SS026-09C			X						7-Jul-09	N
CJCA-SS027	CJCA-SS027-09C			X						8-Jul-09	N
CJCA-SS028	CJCA-SS028-09C			X		X				7-Jul-09	N
CJCA-SS029	CJCA-SS029-09C			X						7-Jul-09	N
CJCA-SS030	CJCA-SS030-09C			X						7-Jul-09	N
CJCA-SS031	CJCA-SS031-09C			X						7-Jul-09	N
CJCA-SS032	CJCA-SS032-09C			X		X				8-Jul-09	N
CJCA-SS033	CJCA-SS033-09C			X						8-Jul-09	N
CJCA-SS034	CJCA-SS034-09C			X						8-Jul-09	N
CJCA-SS035	CJCA-SS035-09C			X						8-Jul-09	N
CJCA-SS036	CJCA-SS036-09C			X						8-Jul-09	N
CJCA-SS037	CJCA-SS037-09C			X						8-Jul-09	N
CJCA-SS038	CJCA-SS038-09C			X		X				8-Jul-09	N
CJCA-SS039	CJCA-SS039-09C			X						8-Jul-09	N
CJCA-SS040	CJCA-SS040-09C			X						8-Jul-09	N
CJCA-SS041	CJCA-SS041-09C			X						8-Jul-09	N
CJCA-SS041	CJCA-SS041D-09C			X						8-Jul-09	FD
CJCA-SS042	CJCA-SS042-09C			X						8-Jul-09	N
CJCA-SS042	CJCA-SS042-09C-MS			X						8-Jul-09	MS
CJCA-SS042	CJCA-SS042-09C-SD			X						8-Jul-09	SD
CJCA-SS043	CJCA-SS043-09C			X						8-Jul-09	N
CJCA-SS044	CJCA-SS044-09C			X						8-Jul-09	N
CJCA-SS044	CJCA-SS044-09C									8-Jul-09	N
CJCA-SS045	CJCA-SS045-09C			X						9-Jul-09	N
CJCA-SS045	CJCA-SS045-09C-MS			X						9-Jul-09	MS
CJCA-SS045	CJCA-SS045-09C-SD			X						9-Jul-09	SD
CJCA-SS046	CJCA-SS046-09C			X						8-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
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Created By: B. Propst  
Checked By: K. Howell



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Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS046	CJCA-SS046D-09C			X						8-Jul-09	FD
CJCA-SS047	CJCA-SS047-09C			X						8-Jul-09	N
CJCA-SS048	CJCA-SS048-09C									8-Jul-09	N
CJCA-SS048	CJCA-SS048-09C			X						8-Jul-09	N
CJCA-SS049	CJCA-SS049-09C			X						8-Jul-09	N
CJCA-SS049	CJCA-SS049-09C-MS			X						8-Jul-09	MS
CJCA-SS049	CJCA-SS049-09C-SD			X						8-Jul-09	SD
CJCA-SS050	CJCA-SS050-09C			X						8-Jul-09	N
CJCA-SS051	CJCA-SS051-09C			X						8-Jul-09	N
CJCA-SS052	CJCA-SS052-09C									8-Jul-09	N
CJCA-SS052	CJCA-SS052-09C			X						8-Jul-09	N
CJCA-SS053	CJCA-SS053-09C			X						8-Jul-09	N
CJCA-SS053	CJCA-SS053D-09C			X						8-Jul-09	FD
CJCA-SS054	CJCA-SS054-09C			X						8-Jul-09	N
CJCA-SS054	CJCA-SS054D-09C			X						8-Jul-09	FD
CJCA-SS055	CJCA-SS055-09C			X						7-Jul-09	N
CJCA-SS056	CJCA-SS056-09C			X						7-Jul-09	N
CJCA-SS056	CJCA-SS056D-09C			X						7-Jul-09	FD
CJCA-SS057	CJCA-SS057-09C			X						7-Jul-09	N
CJCA-SS058	CJCA-SS058-09C			X						7-Jul-09	N
CJCA-SS058	CJCA-SS058-09C									7-Jul-09	N
CJCA-SS059	CJCA-SS059-09C			X						7-Jul-09	N
CJCA-SS060	CJCA-SS060-09C			X						7-Jul-09	N
CJCA-SS061	CJCA-SS061-09C			X						8-Jul-09	N
CJCA-SS062	CJCA-SS062-09C			X						9-Jul-09	N
CJCA-SS063	CJCA-SS063-09C									9-Jul-09	N
CJCA-SS063	CJCA-SS063-09C			X						9-Jul-09	N
CJCA-SS064	CJCA-SS064-09C			X						9-Jul-09	N
CJCA-SS065	CJCA-SS065-09C			X						9-Jul-09	N
CJCA-SS066	CJCA-SS066-09C			X						9-Jul-09	N
CJCA-SS066	CJCA-SS066-09C									9-Jul-09	N
CJCA-SS067	CJCA-SS067-09C			X						9-Jul-09	N
CJCA-SS068	CJCA-SS068-09C									9-Jul-09	N
CJCA-SS068	CJCA-SS068-09C			X						9-Jul-09	N
CJCA-SS069	CJCA-SS069-09C			X						9-Jul-09	N
CJCA-SS070	CJCA-SS070-09C			X						8-Jul-09	N
CJCA-SS070	CJCA-SS070D-09C			X						8-Jul-09	FD
CJCA-SS071	CJCA-SS071-09C			X						8-Jul-09	N
CJCA-SS072	CJCA-SS072-09C			X						8-Jul-09	N
CJCA-SS073	CJCA-SS073-09C			X						8-Jul-09	N
CJCA-SS074	CJCA-SS074-09C			X						9-Jul-09	N

Notes:  
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Master Sampling Table  
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MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS074	CJCA-SS074-09C									9-Jul-09	N
CJCA-SS075	CJCA-SS075-09C			X						9-Jul-09	N
CJCA-SS076	CJCA-SS076-09C			X						8-Jul-09	N
CJCA-SS077	CJCA-SS077-09C			X						9-Jul-09	N
CJCA-SS078	CJCA-SS078-09C			X						9-Jul-09	N
CJCA-SS079	CJCA-SS079-09C			X						8-Jul-09	N
CJCA-SS080	CJCA-SS080-09C			X						9-Jul-09	N
CJCA-SS080	CJCA-SS080D-09C			X						9-Jul-09	FD
CJCA-SS081	CJCA-SS081-09C			X						9-Jul-09	N
CJCA-SS081	CJCA-SS081-09C-MS			X						9-Jul-09	MS
CJCA-SS081	CJCA-SS081-09C-SD			X						9-Jul-09	SD
CJCA-SS082	CJCA-SS082-09C			X						8-Jul-09	N
CJCA-SS083	CJCA-SS083-09C									9-Jul-09	N
CJCA-SS083	CJCA-SS083-09C			X						9-Jul-09	N
CJCA-SS084	CJCA-SS084-09C			X						9-Jul-09	N
CJCA-SS085	CJCA-SS085-09C			X						7-Jul-09	N
CJCA-SS086	CJCA-SS086-09C			X						7-Jul-09	N
CJCA-SS086	CJCA-SS086-09C									7-Jul-09	N
CJCA-SS087	CJCA-SS087-09C			X						7-Jul-09	N
CJCA-SS088	CJCA-SS088-09C			X						7-Jul-09	N
CJCA-SS089	CJCA-SS089-09C			X						7-Jul-09	N
CJCA-SS090	CJCA-SS090-09C			X						7-Jul-09	N
CJCA-SS090	CJCA-SS090-09C-MS			X						7-Jul-09	MS
CJCA-SS090	CJCA-SS090-09C-SD			X						7-Jul-09	SD
CJCA-SS091	CJCA-SS091-09C			X						7-Jul-09	N
CJCA-SS092	CJCA-SS092-09C			X						7-Jul-09	N
CJCA-SS092	CJCA-SS092-09C									7-Jul-09	N
CJCA-SS092	CJCA-SS092D-09C									7-Jul-09	FD
CJCA-SS092	CJCA-SS092D-09C			X						7-Jul-09	FD
CJCA-SS093	CJCA-SS093-09C			X						7-Jul-09	N
CJCA-SS094	CJCA-SS094-09C			X						7-Jul-09	N
CJCA-SS095	CJCA-SS095-09C			X						7-Jul-09	N
CJCA-SS096	CJCA-SS096-09C			X						7-Jul-09	N
CJCA-SS097	CJCA-SS097-09C			X						7-Jul-09	N
CJCA-SS097	CJCA-SS097-09C									7-Jul-09	N
CJCA-SS098	CJCA-SS098-09C			X						7-Jul-09	N
CJCA-SS099	CJCA-SS099-09C			X						7-Jul-09	N
CJCA-SS100	CJCA-SS100-09C			X						9-Jul-09	N
CJCA-SS100	CJCA-SS100-09C									9-Jul-09	N
CJCA-SS101	CJCA-SS101-09C			X						9-Jul-09	N
CJCA-SS102	CJCA-SS102-09C			X						9-Jul-09	N

Notes:  
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SD-Spike Duplicate  
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Created By: B. Propst  
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MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS103	CJCA-SS103-09C			X						9-Jul-09	N
CJCA-SS103	CJCA-SS103-09C									9-Jul-09	N
CJCA-SS104	CJCA-SS104-09C			X						9-Jul-09	N
CJCA-SS105	CJCA-SS105-09C			X						9-Jul-09	N
CJCA-SS105	CJCA-SS105D-09C			X						9-Jul-09	FD
CJCA-SS106	CJCA-SS106-09C			X						9-Jul-09	N
CJCA-SS106	CJCA-SS106-09C									9-Jul-09	N
CJCA-SS107	CJCA-SS107-09C			X						9-Jul-09	N
CJCA-SS108	CJCA-SS108-09C			X						9-Jul-09	N
CJCA-SS109	CJCA-SS109-09C			X						9-Jul-09	N
CJCA-SS110	CJCA-SS110-09C			X						8-Jul-09	N
CJCA-SS111	CJCA-SS111-09C			X						8-Jul-09	N
CJCA-SS112	CJCA-SS112-09C			X						9-Jul-09	N
CJCA-SS113	CJCA-SS113-09C			X						8-Jul-09	N
CJCA-SS114	CJCA-SS114-09C			X						8-Jul-09	N
CJCA-SS114	CJCA-SS114-09C-MS			X						8-Jul-09	MS
CJCA-SS114	CJCA-SS114-09C-SD			X						8-Jul-09	SD
CJCA-SS115	CJCA-SS115-09C			X						9-Jul-09	N
CJCA-SS116	CJCA-SS116-09C			X						8-Jul-09	N
CJCA-SS117	CJCA-SS117-09C			X						8-Jul-09	N
CJCA-SS118	CJCA-SS118-09C			X						9-Jul-09	N
CJCA-SS119	CJCA-SS119-09C			X						8-Jul-09	N
CJCA-SS120	CJCA-SS120-09C			X						8-Jul-09	N
CJCA-SS121	CJCA-SS121-09C			X						8-Jul-09	N
CJCA-SS122	CJCA-SS122-09C			X						8-Jul-09	N
CJCA-SS123	CJCA-SS123-09C			X						8-Jul-09	N
CJCA-SS124	CJCA-SS124-09C			X						8-Jul-09	N
CJCA-SS125	CJCA-SS125-09C			X						8-Jul-09	N
CJCA-SS126	CJCA-SS126-09C			X						8-Jul-09	N
CJCA-SS127	CJCA-SS127-09C			X						9-Jul-09	N
CJCA-SS128	CJCA-SS128-09C			X						8-Jul-09	N
CJCA-SS129	CJCA-SS129-09C			X						9-Jul-09	N
CJCA-SS130	CJCA-SS130-09C			X						8-Jul-09	N
CJCA-SS130	CJCA-SS130D-09C			X						8-Jul-09	FD
CJCA-SS131	CJCA-SS131-09C			X						8-Jul-09	N
CJCA-SS132	CJCA-SS132-09C			X						8-Jul-09	N
CJCA-SS133	CJCA-SS133-09C			X						8-Jul-09	N
CJCA-SS134	CJCA-SS134-09C			X						8-Jul-09	N
CJCA-SS134	CJCA-SS134-09C-MS			X						8-Jul-09	MS
CJCA-SS134	CJCA-SS134-09C-SD			X						8-Jul-09	SD
CJCA-SS135	CJCA-SS135-09C			X						9-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

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MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS136	CJCA-SS136-09C									9-Jul-09	N
CJCA-SS136	CJCA-SS136-09C			X						9-Jul-09	N
CJCA-SS137	CJCA-SS137-09C			X						9-Jul-09	N
CJCA-SS138	CJCA-SS138-09C			X						9-Jul-09	N
CJCA-SS138	CJCA-SS138D-09C			X						9-Jul-09	FD
CJCA-SS139	CJCA-SS139-09C			X						9-Jul-09	N
CJCA-SS140	CJCA-SS140-09C			X						9-Jul-09	N
CJCA-SS140	CJCA-SS140D-09C			X						9-Jul-09	FD
CJCA-SS141	CJCA-SS141-09C			X						8-Jul-09	N
CJCA-SS142	CJCA-SS142-09C			X						9-Jul-09	N
CJCA-SS142	CJCA-SS142-09C-MS			X						9-Jul-09	MS
CJCA-SS142	CJCA-SS142-09C-SD			X						9-Jul-09	SD
CJCA-SS143	CJCA-SS143-09C			X						9-Jul-09	N
CJCA-SS144	CJCA-SS144-09C									8-Jul-09	N
CJCA-SS144	CJCA-SS144-09C			X						8-Jul-09	N
CJCA-SS145	CJCA-SS145-09C			X						9-Jul-09	N
CJCA-SS146	CJCA-SS146-09C			X						9-Jul-09	N
CJCA-SS147	CJCA-SS147-09C			X						9-Jul-09	N
CJCA-SS148	CJCA-SS148-09C			X						9-Jul-09	N
CJCA-SS148	CJCA-SS148-09C-MS			X						9-Jul-09	MS
CJCA-SS148	CJCA-SS148-09C-SD			X						9-Jul-09	SD
CJCA-SS148	CJCA-SS148D-09C			X						9-Jul-09	FD
CJCA-SS149	CJCA-SS149-09C			X						9-Jul-09	N
CJCA-SS150	CJCA-SS150-09C			X						9-Jul-09	N
CJCA-SS151	CJCA-SS151-09C			X						9-Jul-09	N
CJCA-SS152	CJCA-SS152-09C			X						10-Jul-09	N
CJCA-SS153	CJCA-SS153-09C			X						9-Jul-09	N
CJCA-SS154	CJCA-SS154-09C			X						10-Jul-09	N
CJCA-SS155	CJCA-SS155-09C			X						9-Jul-09	N
CJCA-SS156	CJCA-SS156-09C			X						9-Jul-09	N
CJCA-SS156	CJCA-SS156-09C-MS			X						9-Jul-09	MS
CJCA-SS156	CJCA-SS156-09C-SD			X						9-Jul-09	SD
CJCA-SS157	CJCA-SS157-09C			X						9-Jul-09	N
CJCA-SS158	CJCA-SS158-09C									9-Jul-09	N
CJCA-SS158	CJCA-SS158-09C			X						9-Jul-09	N
CJCA-SS159	CJCA-SS159-09C			X						8-Jul-09	N
CJCA-SS160	CJCA-SS160-09C			X						8-Jul-09	N
CJCA-SS161	CJCA-SS161-09C			X						9-Jul-09	N
CJCA-SS162	CJCA-SS162-09C			X						8-Jul-09	N
CJCA-SS163	CJCA-SS163-09C			X						8-Jul-09	N
CJCA-SS163	CJCA-SS163D-09C			X						8-Jul-09	FD

Notes:  
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Checked By: K. Howell



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MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS164	CJCA-SS164-09C			X						9-Jul-09	N
CJCA-SS164	CJCA-SS164D-09C			X						9-Jul-09	FD
CJCA-SS165	CJCA-SS165-09C			X		X				9-Jul-09	N
CJCA-SS166	CJCA-SS166-09C			X		X				9-Jul-09	N
CJCA-SS167	CJCA-SS167-09C			X						9-Jul-09	N
CJCA-SS167	CJCA-SS167D-09C			X						9-Jul-09	FD
CJCA-SS168	CJCA-SS168-09C			X						8-Jul-09	N
CJCA-SS169	CJCA-SS169-09C			X						8-Jul-09	N
CJCA-SS170	CJCA-SS170-09C			X						9-Jul-09	N
CJCA-SS171	CJCA-SS171-09C			X						8-Jul-09	N
CJCA-SS172	CJCA-SS172-09C			X		X				8-Jul-09	N
CJCA-SS173	CJCA-SS173-09C			X						9-Jul-09	N
CJCA-SS174	CJCA-SS174-09C			X						8-Jul-09	N
CJCA-SS175	CJCA-SS175-09C			X						8-Jul-09	N
CJCA-SS175	CJCA-SS175D-09C			X						8-Jul-09	FD
CJCA-SS176	CJCA-SS176-09C			X						9-Jul-09	N
CJCA-SS176	CJCA-SS176D-09C			X						9-Jul-09	FD
CJCA-SS177	CJCA-SS177-09C			X						8-Jul-09	N
CJCA-SS178	CJCA-SS178-09C			X						8-Jul-09	N
CJCA-SS179	CJCA-SS179-09C			X						8-Jul-09	N
CJCA-SS180	CJCA-SS180-09C			X						8-Jul-09	N
CJCA-SS181	CJCA-SS181-09C			X						8-Jul-09	N
CJCA-SS182	CJCA-SS182-09C			X						8-Jul-09	N
CJCA-SS183	CJCA-SS183-09C			X						8-Jul-09	N
CJCA-SS184	CJCA-SS184-09C			X						8-Jul-09	N
CJCA-SS185	CJCA-SS185-09C			X		X				9-Jul-09	N
CJCA-SS186	CJCA-SS186-09C			X						8-Jul-09	N
CJCA-SS186	CJCA-SS186D-09C			X						8-Jul-09	FD
CJCA-SS187	CJCA-SS187-09C			X						8-Jul-09	N
CJCA-SS187	CJCA-SS187-09C-MS			X						8-Jul-09	MS
CJCA-SS187	CJCA-SS187-09C-SD			X						8-Jul-09	SD
CJCA-SS188	CJCA-SS188-09C			X		X				9-Jul-09	N
CJCA-SS189	CJCA-SS189-09C			X						8-Jul-09	N
CJCA-SS190	CJCA-SS190-09C			X						8-Jul-09	N
CJCA-SS191	CJCA-SS191-09C			X		X				9-Jul-09	N
CJCA-SS192	CJCA-SS192-09C			X						8-Jul-09	N
CJCA-SS193	CJCA-SS193-09C			X						8-Jul-09	N
CJCA-SS193	CJCA-SS193D-09C			X						8-Jul-09	FD
CJCA-SS194	CJCA-SS194-09C			X		X				9-Jul-09	N
CJCA-SS194	CJCA-SS194-09C-MS			X						9-Jul-09	MS
CJCA-SS194	CJCA-SS194-09C-SD			X						9-Jul-09	SD

Notes:  
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Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-SS195	CJCA-SS195-09C			X		X	X		X	9-Jul-09	N
CJCA-SS196	CJCA-SS196-09C			X						9-Jul-09	N
CJCA-SS197	CJCA-SS197-09C			X		X				9-Jul-09	N
CJCA-SS198	CJCA-SS198-09C			X		X				9-Jul-09	N
CJCA-SS199	CJCA-SS199-09C			X		X				9-Jul-09	N
CJCA-SS200	CJCA-SS200-09C			X						7-Jul-09	N
CJCA-SS201	CJCA-SS201-09C			X						7-Jul-09	N
CJCA-SS201	CJCA-SS201-09C-MS			X						7-Jul-09	MS
CJCA-SS201	CJCA-SS201-09C-SD			X						7-Jul-09	SD
CJCA-SS202	CJCA-SS202-09C			X						7-Jul-09	N
CJCA-SS203	CJCA-SS203-09C			X						7-Jul-09	N
CJCA-SS203	CJCA-SS203D-09C			X						7-Jul-09	FD
CJCA-SS204	CJCA-SS204-09C			X						7-Jul-09	N
CJCA-SS205	CJCA-SS205-09C			X						7-Jul-09	N
CJCA-SS205	CJCA-SS205-09C-MS			X						7-Jul-09	MS
CJCA-SS205	CJCA-SS205-09C-SD			X						7-Jul-09	SD
CJCA-SS206	CJCA-SS206-09C			X						7-Jul-09	N
CJCA-SS207	CJCA-SS207-09C			X						7-Jul-09	N
CJCA-SS208	CJCA-SS208-09C			X						7-Jul-09	N
CJCA-SS209	CJCA-SS209-09C			X						7-Jul-09	N
CJCA-SS210	CJCA-SS210-09C			X		X				7-Jul-09	N
CJCA-SS211	CJCA-SS211-09C			X						7-Jul-09	N
CJCA-SS212	CJCA-SS212-09C			X		X				9-Jul-09	N
CJCA-SS213	CJCA-SS213-09C			X						7-Jul-09	N
CJCA-SS214	CJCA-SS214-09C			X						7-Jul-09	N
Camp Johnson Construction Area Sample Quality Control Blanks											
CJCA-QC	CJCA-EB01-072109-IS			X						21-Jul-09	EB
CJCA-QC	CJCA-EB01-072509-IS			X						25-Jul-09	EB
CJCA-QC	CJCA-EB01-072609			X						26-Jul-09	EB
CJCA-QC	CJCA-EB01-072709-GW			X						27-Jul-09	EB
CJCA-QC	CJCA-EB01-072909-IS			X						29-Jul-09	EB
CJCA-QC	CJCA-EB02-072709-GW			X						27-Jul-09	EB
CJCA-QC	CJCA-EB02-072709-GW-MS			X						27-Jul-09	MS
CJCA-QC	CJCA-EB02-072709-GW-SD			X						27-Jul-09	SD
CJCA-QC	CJCA-EB02-072909-IS			X			X	X	X	29-Jul-09	EB
CJCA-QC	CJCA-EB02-073009			X			X	X	X	30-Jul-09	EB
CJCA-QC	CJCA-EB03-072709-GW			X						27-Jul-09	EB
CJCA-QC	CJCA-EB070709			X						7-Jul-09	EB
CJCA-QC	CJCA-EB070809			X						8-Jul-09	EB
CJCA-QC	CJCA-EB070909			X						9-Jul-09	EB
CJCA-QC	CJCA-FB01-072109-IS			X						21-Jul-09	FB

Notes:  
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Created By: B. Propst  
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Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
CJCA-QC	CJCA-FB01-072909			X			X	X	X	29-Jul-09	FB
CJCA-QC	CJCA-TB02-072909							X		29-Jul-09	TB
CJCA-QC	CJCA-FB070709			X						7-Jul-09	FB
Site 15 Groundwater											
IR15-TW01	IR15-TW01-09C	X	X				X	X	X	29-Jul-09	N
IR15-TW01	IR15-TW01-09C-MS		X							29-Jul-09	MS
IR15-TW01	IR15-TW01-09C-SD		X							29-Jul-09	SD
IR15-TW02	IR15-TW02-09C	X	X				X	X	X	29-Jul-09	N
IR15-TW03	IR15-TW03-09C	X	X					X		28-Jul-09	N
IR15-TW03	IR15-TW03D-09C	X	X					X		28-Jul-09	FD
IR15-TW04	IR15-TW04-09C	X	X				X	X	X	29-Jul-09	N
IR15-TW05	IR15-TW05-09C	X	X					X		28-Jul-09	N
Site 15 Subsurface Soil											
IR15-SB01	IR15-SB01-4-6-09C	X				X	X	X	X	29-Jul-09	N
IR15-SB02	IR15-SB02-2-7-09C	X				X	X	X	X	26-Jul-09	N
IR15-SB02	IR15-SB02D-2-7-09C	X				X	X	X	X	26-Jul-09	FD
IR15-SB03	IR15-SB03-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR15-SB04	IR15-SB04-2-7-09C	X				X	X	X	X	27-Jul-09	N
IR15-SB05	IR15-SB05-2-7-09C	X				X	X	X	X	27-Jul-09	N
IR15-SB05	IR15-SB05-2-7-09C-MS	X				X	X	X	X	27-Jul-09	MS
IR15-SB05	IR15-SB05-2-7-09C-SD	X				X	X	X	X	27-Jul-09	SD
IR15-SB06	IR15-SB06-2-7-09C	X				X	X	X	X	27-Jul-09	N
IR15-SB07	IR15-SB07-2-4-09C	X				X	X	X	X	27-Jul-09	N
IR15-SB08	IR15-SB08-2-4-09C	X				X	X	X	X	29-Jul-09	N
IR15-SB09	IR15-SB09-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR15-SB10	IR15-SB10-2-4-09C	X				X	X	X	X	29-Jul-09	N
Site 15 Surface Soil											
IR15-SS01	IR15-SS01-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS02	IR15-SS02-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS03	IR15-SS03-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS03	IR15-SS03D-00-01-09C	X				X	X	X	X	10-Jul-09	FD
IR15-SS04	IR15-SS04-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS05	IR15-SS05-00-01-09C	X				X	X		X	10-Jul-09	N
IR15-SS05	IR15-SS05-00-01-09C-MS	X				X	X		X	10-Jul-09	MS
IR15-SS05	IR15-SS05-00-01-09C-SD	X				X	X		X	10-Jul-09	SD
IR15-SS06	IR15-SS06-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS07	IR15-SS07-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS08	IR15-SS08-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS09	IR15-SS09-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR15-SS10	IR15-SS10-00-01-09C	X				X	X	X	X	10-Jul-09	N

Notes:  
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Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
<b>Site 15 Quality Control Blanks</b>											
Site15-QC	IR15-EB071009	X				X	X	X	X	10-Jul-09	EB
Site15-QC	IR15-FB071009	X				X	X	X	X	10-Jul-09	FB
Site15-QC	IR15-TB01-072609							X		26-Jul-09	TB
Site15-QC	IR15-TB01-072709							X		27-Jul-09	TB
Site15-QC	IR15-TB01-072809							X		28-Jul-09	TB
Site15-QC	IR15-TB01-072909							X		29-Jul-09	TB
<b>Site 17 Groundwater</b>											
IR17-TW01	IR17-TW01-09C-MS	X								29-Jul-09	MS
IR17-TW01	IR17-TW01-09C-SD	X								29-Jul-09	SD
IR17-TW02	IR17-TW02-09C	X	X				X	X	X	29-Jul-09	N
IR17-TW02	IR17-TW02D-09C	X	X				X	X	X	29-Jul-09	FD
<b>Site 17 Subsurface Soil</b>											
IR17-SB01	IR17-SB01-2-4-09C	X				X	X	X	X	27-Jul-09	N
IR17-SB03	IR17-SB03-2-7-09C	X				X		X	X	28-Jul-09	N
IR17-SB03	IR17-SB03D-2-7-09C	X				X	X	X	X	28-Jul-09	FD
IR17-SB04	IR17-SB04-2-7-09C	X				X	X	X	X	28-Jul-09	N
IR17-SB05	IR17-SB05-2-7-09C	X				X	X	X	X	28-Jul-09	N
<b>Site 17 Surface Soil</b>											
IR17-SS01	IR17-SS01-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR17-SS01	IR17-SS01D-00-01-09C	X				X	X	X	X	10-Jul-09	FD
IR17-SS02	IR17-SS02-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR17-SS03	IR17-SS03-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR17-SS04	IR17-SS04-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR17-SS05	IR17-SS05-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR17-SS05	IR17-SS05-00-01-09C-MS	X				X	X	X	X	10-Jul-09	MS
IR17-SS05	IR17-SS05-00-01-09C-SD	X				X	X	X	X	10-Jul-09	SD
<b>Site 17 Quality Control Blanks</b>											
Site17-QC	IR17-EB071009	X				X	X	X	X	10-Jul-09	EB
Site17-QC	IR17-FB071009	X				X	X	X	X	10-Jul-09	FB
Site17-QC	IR17-TB01-072809							X		28-Jul-09	TB
Site17-QC	IR17-TB02-072809							X		28-Jul-09	TB
Site17-QC	IR17-TB071009							X		10-Jul-09	TB
<b>Site 85 Groundwater</b>											
IR85-MW01	IR85-MW01-09C	X					X	X	X	23-Jul-09	N
IR85-MW02	IR85-MW02-09C	X					X	X	X	23-Jul-09	N
IR85-MW04	IR85-MW04-09C	X					X	X	X	22-Jul-09	N
IR85-MW04	IR85-MW04-09C-MS	X					X	X	X	22-Jul-09	MS
IR85-MW04	IR85-MW04-09C-SD	X					X	X	X	22-Jul-09	SD
IR85-MW05	IR85-MW05-09C	X					X	X	X	21-Jul-09	N
IR85-TW04	IR85-TW04-09C	X	X				X	X	X	27-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
IR85-TW05	IR85-TW05-09C	X	X				X	X	X	29-Jul-09	N
IR85-TW06	IR85-TW06-09C	X	X				X	X	X	30-Jul-09	N
IR85-TW06	IR85-TW06D-09C	X	X				X	X	X	30-Jul-09	FD
IR85-TW06	IR85-TW06D-09C-MS		X							30-Jul-09	MS
IR85-TW06	IR85-TW06D-09C-SD		X							30-Jul-09	SD
IR85-TW07	IR85-TW07-09C	X	X				X	X	X	30-Jul-09	N
IR85-TW08	IR85-TW08-09C	X	X				X	X	X	30-Jul-09	N
Site 85 Subsurface Soil											
IR85-SB06	IR85-SB06-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR85-SB06	IR85-SB06-2-7-09C-MS	X				X	X	X	X	29-Jul-09	MS
IR85-SB06	IR85-SB06-2-7-09C-SD	X				X	X	X	X	29-Jul-09	SD
IR85-SB07	IR85-SB07-2-4-09C	X				X	X	X	X	28-Jul-09	N
IR85-SB08	IR85-SB08-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR85-SB09	IR85-SB09-2-7-09C	X				X	X	X	X	27-Jul-09	N
IR85-SB10	IR85-SB10-4-7-09C	X				X	X	X	X	29-Jul-09	N
IR85-SB11	IR85-SB11-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR85-SB12	IR85-SB12-2-7-09C	X					X	X	X	28-Jul-09	N
IR85-SB13	IR85-SB13-2-7-09C	X				X	X	X	X	28-Jul-09	N
IR85-SB14	IR85-SB14-2-7-09C	X				X	X	X	X	29-Jul-09	N
IR85-SB17	IR85-SB17-6-7-09C	X				X	X	X	X	28-Jul-09	N
IR85-SB17	IR85-SB17D-6-7-09C	X				X	X	X	X	28-Jul-09	FD
Site 85 Battery Sample											
IR85-BAT	IR85-BAT-071009	X								10-Jul-09	N
Site 85 Surface Soil											
IR85-SS06	IR85-SS06-00-01-09C	X				X	X	X	X	9-Jul-09	N
IR85-SS07	IR85-SS07-00-01-09C	X				X	X	X	X	9-Jul-09	N
IR85-SS08	IR85-SS08-00-01-09C	X				X	X	X	X	9-Jul-09	N
IR85-SS09	IR85-SS09-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS09	IR85-SS09D-00-01-09C	X				X	X	X	X	10-Jul-09	FD
IR85-SS10	IR85-SS10-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS11	IR85-SS11-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS12	IR85-SS12-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS13	IR85-SS13-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS14	IR85-SS14-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS14	IR85-SS14D-00-01-09C	X				X	X	X	X	10-Jul-09	FD
IR85-SS15	IR85-SS15-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS16	IR85-SS16-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS17	IR85-SS17-00-01-09C	X				X	X	X	X	10-Jul-09	N
IR85-SS18	IR85-SS18-00-01-09C	X				X	X	X	X	10-Jul-09	N

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



TABLE 4-1

Master Sampling Table  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CampLej, North Carolina

Station ID	Sample ID	Total Metals 6010B	Total Dissolved Metals 6010B	Select Metals 6010B	Select Dissolved Metals 6010B	pH 9045	SVOCs 8270C	VOCs 8260B	Pest/PCBs 8081/8082	Sample Date	Sample Type
IR85-SS18	IR85-SS18-00-01-09C-MS	X				X	X	X	X	10-Jul-09	MS
IR85-SS18	IR85-SS18-00-01-09C-SD	X				X	X	X	X	10-Jul-09	SD
Site 85 Quality Control Blanks											
Site85-QC	IR85-EB01-073009	X					X	X	X	30-Jul-09	EB
Site85-QC	IR85-EB070909	X					X	X	X	9-Jul-09	EB
Site85-QC	IR85-EB071009	X					X	X	X	10-Jul-09	EB
Site85-QC	IR85-FB070909	X					X	X	X	9-Jul-09	FB
Site85-QC	IR85-TB01-072109							X		21-Jul-09	TB
Site85-QC	IR85-TB01-072209							X		22-Jul-09	TB
Site85-QC	IR85-TB01-072309							X		23-Jul-09	TB
Site85-QC	IR85-TB01-072809							X		28-Jul-09	TB
Site85-QC	IR85-TB070909							X		9-Jul-09	TB
Site85-QC	IR85-TB071009							X		10-Jul-09	TB
Site85-QC	IR85-TB073009							X		30-Jul-09	TB

Notes:  
N-Normal  
FD-Field Duplicate  
MS-Matrix Spike  
SD-Spike Duplicate  
EB-Equipment Blank  
FB-Field Blank  
TB-Trip Blank

Created By: B. Propst  
Checked By: K. Howell



**TABLE 4-2**

Summary of Water Quality Data  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Well ID	Date	Sample Time	Temp. (°C)	Cond. (mS/cm)	DO (mg/L)	pH (SU)	ORP (mV)	Turbidity (NTU)
CJCA - TW01	7/28/2009	10:55	18.50	0.066	0.32	4.73	-66	Out of range
CJCA - TW02	7/28/2009	10:20	19.00	0.481*	0.00	7.89	-30	3.4
CJCA - TW03	7/28/2009	12:10	17.81	0.072*	1.28	6.63	114	390.0
CJCA - TW04	7/29/2009	11:10	20.25	1.14*	3.18	6.91	49	4.1
CJCA - TW05	7/28/2009	8:55	17.80	0.509*	1.71	6.17	164	1.5
CJCA - TW06	7/28/2009	9:00	18.24	0.063	3.58	4.88	87	26.0
CJCA - TW08	7/27/2009	10:20	20.15	1.28	0.00	7.99	-59	3.9
CJCA - TW09	7/26/2009	15:40	19.57	56.9	0.45	6.28	46	1.2
CJCA - TW10	7/27/2009	12:15	21.03	0.108	0.15	7.59	-108	13.0
CJCA - TW11	7/27/2009	15:40	19.97	0.095	1.00	6.58	24	1.8
CJCA - TW12	7/26/2009	13:50	18.85	2.96	0.54	6.29	66	1.1
CJCA - TW13	7/26/2009	14:35	19.44	0.062	1.73	5.59	-65	10.0
CJCA - TW14	7/26/2009	14:00	19.28	0.063	4.01	5.32	-66	3.3
CJCA - TW15	7/26/2009	13:15	19.90	0.080	4.30	4.33	199	4.3
CJCA - TW16	7/25/2009	17:05	20.04	0.064	3.66	4.10	157	3.2
CJCA - TW17	7/24/2009	8:35	19.46	0.103	6.21	6.05	93	220.0
CJCA - TW18	7/26/2009	11:05	18.33	0.061	0.91	5.38	-80	7.0
CJCA - TW19	7/26/2009	11:00	19.15	3.09	0.92	6.90	16	2.8
CJCA - TW20	7/26/2009	10:15	18.69	0.070	2.37	4.57	141	4.2
CJCA - TW21	7/26/2009	9:20	19.99	0.128	6.05	6.55	49	5.2
CJCA - TW22	7/24/2009	11:50	18.98	0.068	0.00	7.64	-51	11.0
CJCA - TW23	7/23/2009	14:30	19.97	1.18	0.90	4.51	215	7.2
CJCA - TW24	7/27/2009	9:25	18.72	0.068	3.90	5.10	-12	2.8
CJCA - TW25	7/27/2009	10:25	18.39	0.074	3.21	5.06	-2	4.0
CJCA - TW26	7/27/2009	12:05	19.43	0.060	2.99	5.58	-7	85.0
CJCA - TW27	7/23/2009	16:20	19.48	0.349	1.89	5.85	147	350.0
CJCA - TW28	7/23/2009	16:50	20.97	0.820	2.99	4.39	90	10.6
CJCA - TW29	7/25/2009	16:45	20.04	0.109	5.09	6.99	45	10.0
CJCA - TW30	7/25/2009	18:10	19.91	8.04	0.18	7.24	3	27.0
CJCA - TW31	7/23/2009	15:20	20.31	0.527	2.26	5.58	-18	80.0
CJCA - TW32	7/25/2009	13:30	19.20	0.018	4.80	4.27	72	110.0
CJCA - TW33	7/25/2009	17:20	18.48	0.061	4.74	4.95	-8	35.0
CJCA - TW34	7/25/2009	13:20	19.29	0.091	2.24	6.02	198	210.0
CJCA - TW35	7/22/2009	16:00	19.18	0.136	6.40	3.92	218	10.0
CJCA - TW36	7/22/2009	9:30	18.25	0.230	0.29	7.08	-97	6.1
CJCA - TW37	7/22/2009	16:40	19.56	0.999	5.56	5.31	103	31.0
CJCA - TW38	7/23/2009	13:15	19.07	0.055	0.40	4.59	-8	10.0
IR15 - TW01	7/28/2009	8:25	20.14	1.04*	1.13	7.91	-21	1.7
IR15 - TW02	7/29/2009	10:25	18.10	0.058	4.82	4.56	124	9.5
IR15 - TW03	7/28/2009	14:05	19.28	0.149*	4.17	6.79	99	2.5
IR15 - TW04	7/29/2009	8:45	18.71	0.193	1.76	6.13	-88	15.0
IR15 - TW05	7/28/2009	16:20	21.62	0.151	6.54	6.05	128	35.0
IR17 - TW01	7/29/2009	14:20	18.90	0.059	2.28	4.94	110	16.0
IR17 - TW02	7/29/2009	15:05	18.79	0.678*	3.88	6.27	151	90.0
IR85 - MW01	7/23/2009	8:42	18.07	0.219	0.28	4.25	240	2.1
IR85 - MW02	7/23/2009	9:40	18.74	0.053	2.74	4.18	349	9.8
IR85 - MW04	7/22/2009	11:00	18.37	0.90	0.25	4.86	144	4.0
IR85 - MW05	7/21/2009	17:20	17.54	1.49	7.15	3.90	203	5.5
IR85 - TW04	7/27/2009	16:30	18.73	0.038	1.26	4.95	166	21.0
IR85 - TW05	7/29/2009	12:30	19.14	0.061	2.20	4.99	90	4.2
IR85 - TW06	7/30/2009	9:43	19.80	0.144	3.04	5.81	-36	370.0
IR85 - TW07	7/30/2009	9:10	19.49	0.713	4.16	5.68	208	3.0
IR85 - TW08	7/30/2009	12:00	19.18	4.25	0.17	6.63	119	450.0

## Notes:

°C=degrees celcius

mS/cm=microsiemens per centimeter

DO=dissolved oxygen

mg/L=milligrams per liter

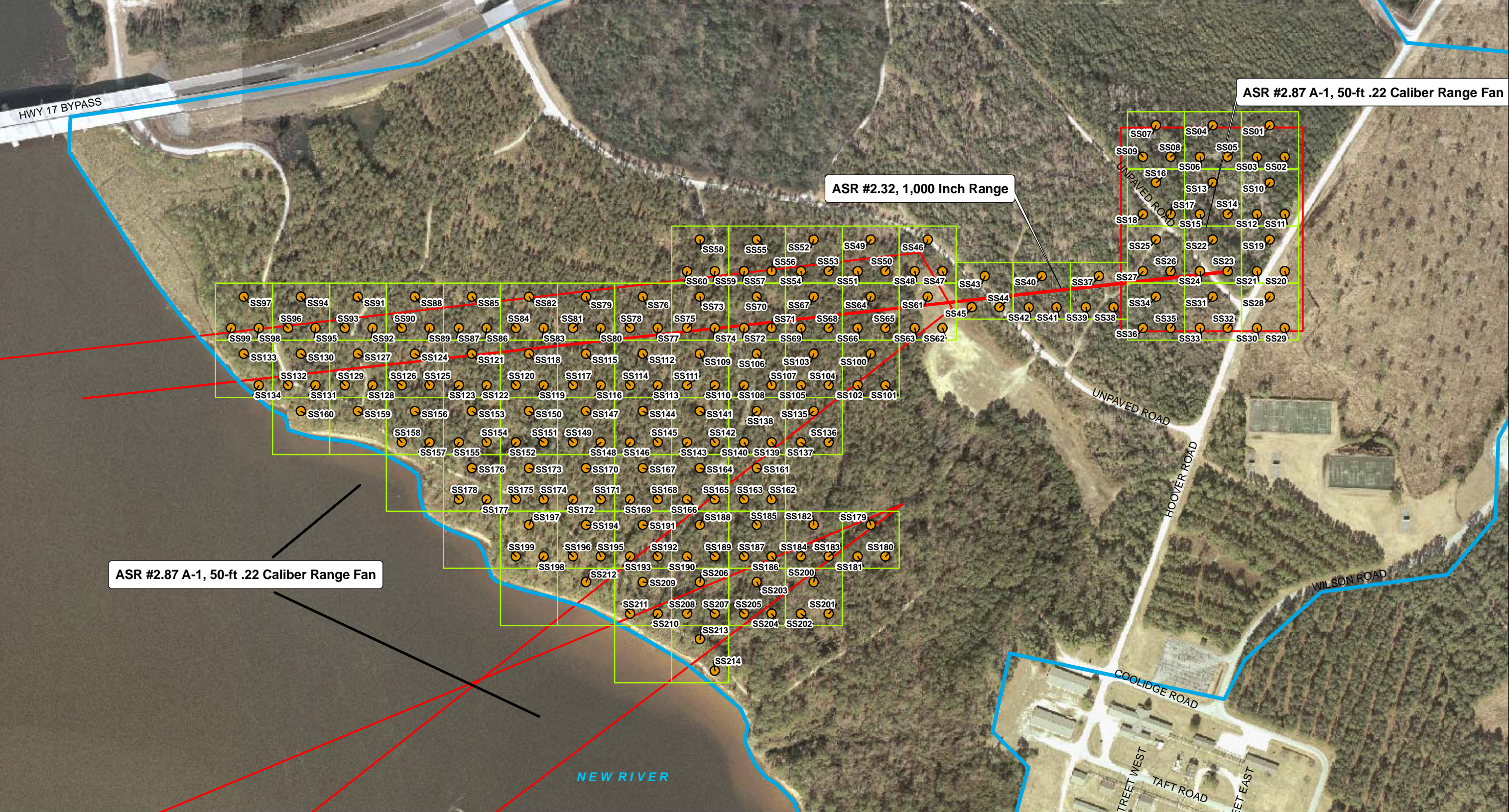
ORP=oxidation-reduction potential

mV=millivolts

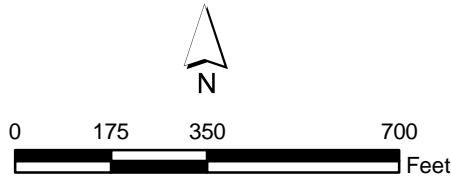
NTU=nepheometric turbidity units

\*water quality meter calibrated out of range.





- Legend**
- TR-02-1 Surface Soil Locations
  - 1 Acre Grid
  - Camp Johnson Construction Area
  - UXO-20



1 inch = 350 feet

ASR #2.87 A-1, 50-ft .22 Caliber Range Fan

ASR #2.32, 1,000 Inch Range

ASR #2.87 A-1, 50-ft .22 Caliber Range Fan

Figure 4-1  
UXO-20 Surface Soil Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLeJ  
North Carolina







# Legend

- Surface/Subsurface Soil Sample
- ⊕ Surface/Subsurface Soil Sample/Temporary Well
- ▨ Approximate Electromagnetic Geophysical Anomaly
- ▭ IR Site 15 Boundary

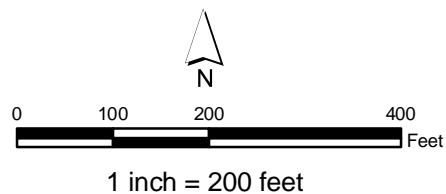


Figure 4-2  
IR Site 15 Environmental Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







#### Legend

- Surface/Subsurface Soil Sample
- ⊕ Surface Soil/Subsurface Soil Sample/Temporary Well
- ▭ Former Range Areas
- ▭ IR Site 17
- ▭ Camp Johnson Construction Area

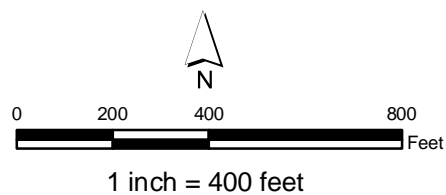
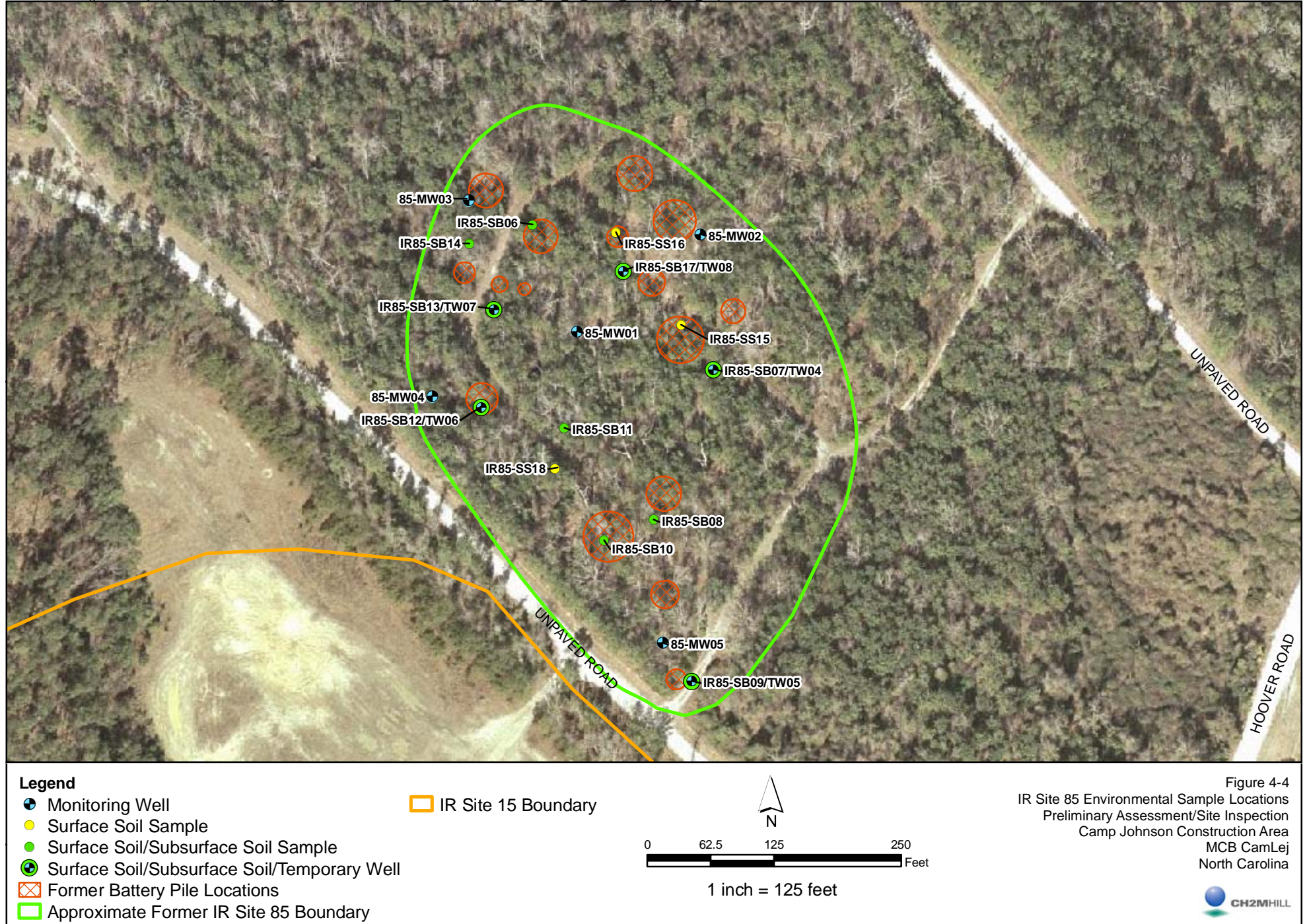


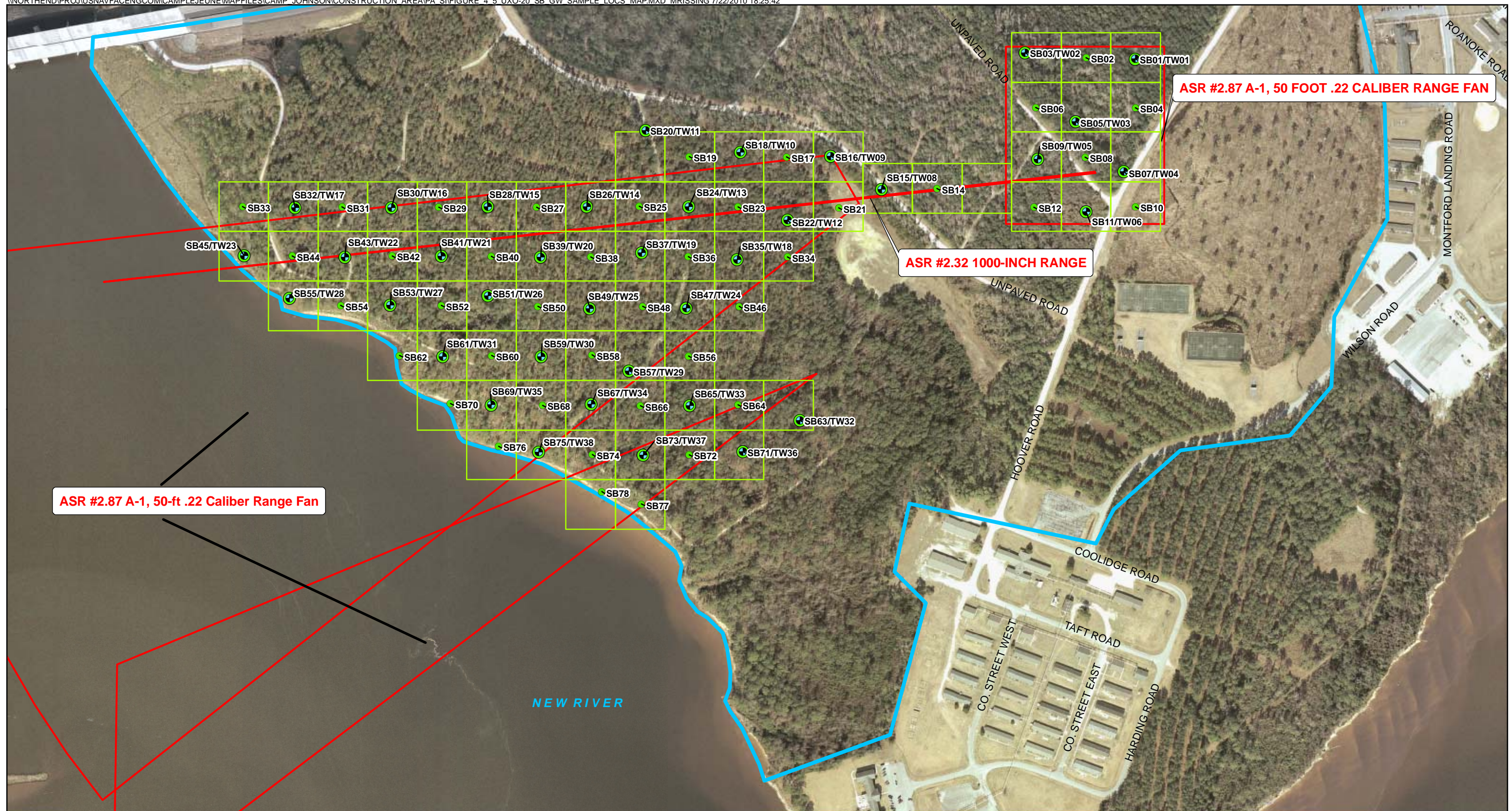
Figure 4-3  
IR Site 17 Environmental Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina











- Legend**
- Subsurface Soil Sample
  - ⊙ Subsurface Soil and Groundwater Sample
  - 1 Acre Grid
  - UXO-20
  - Camp Johnson Construction Area

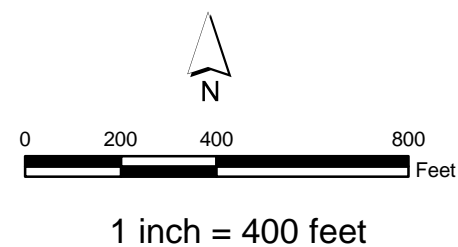
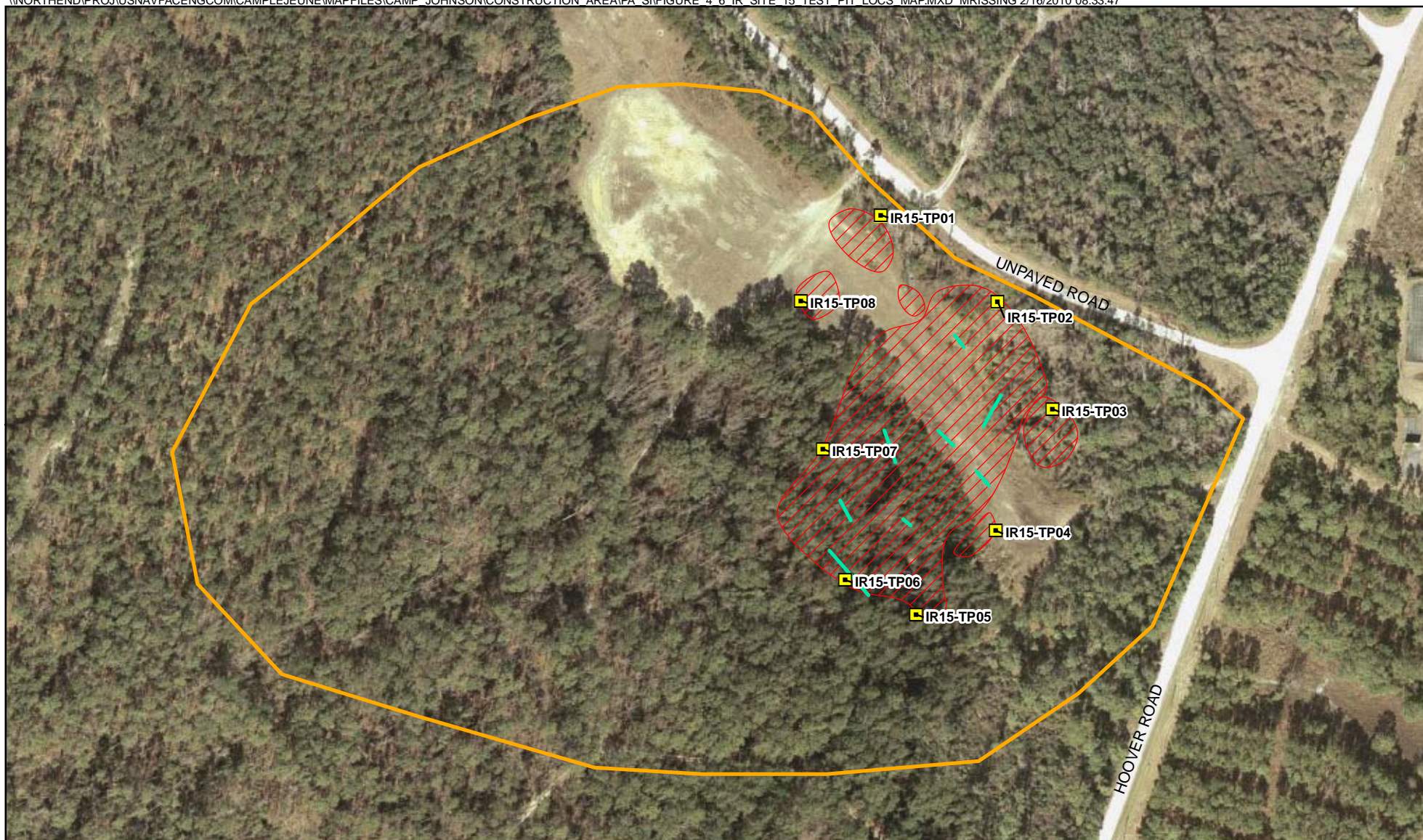


Figure 4-5  
UXO-20 Subsurface Soil and Groundwater Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







#### Legend

- Test Pit Locations
- Former Test Trench
- ▨ Approximate Electromagnetic Geophysical Anomaly
- ▭ IR Site 15 Boundary

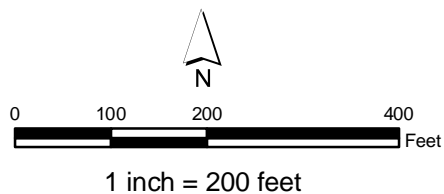
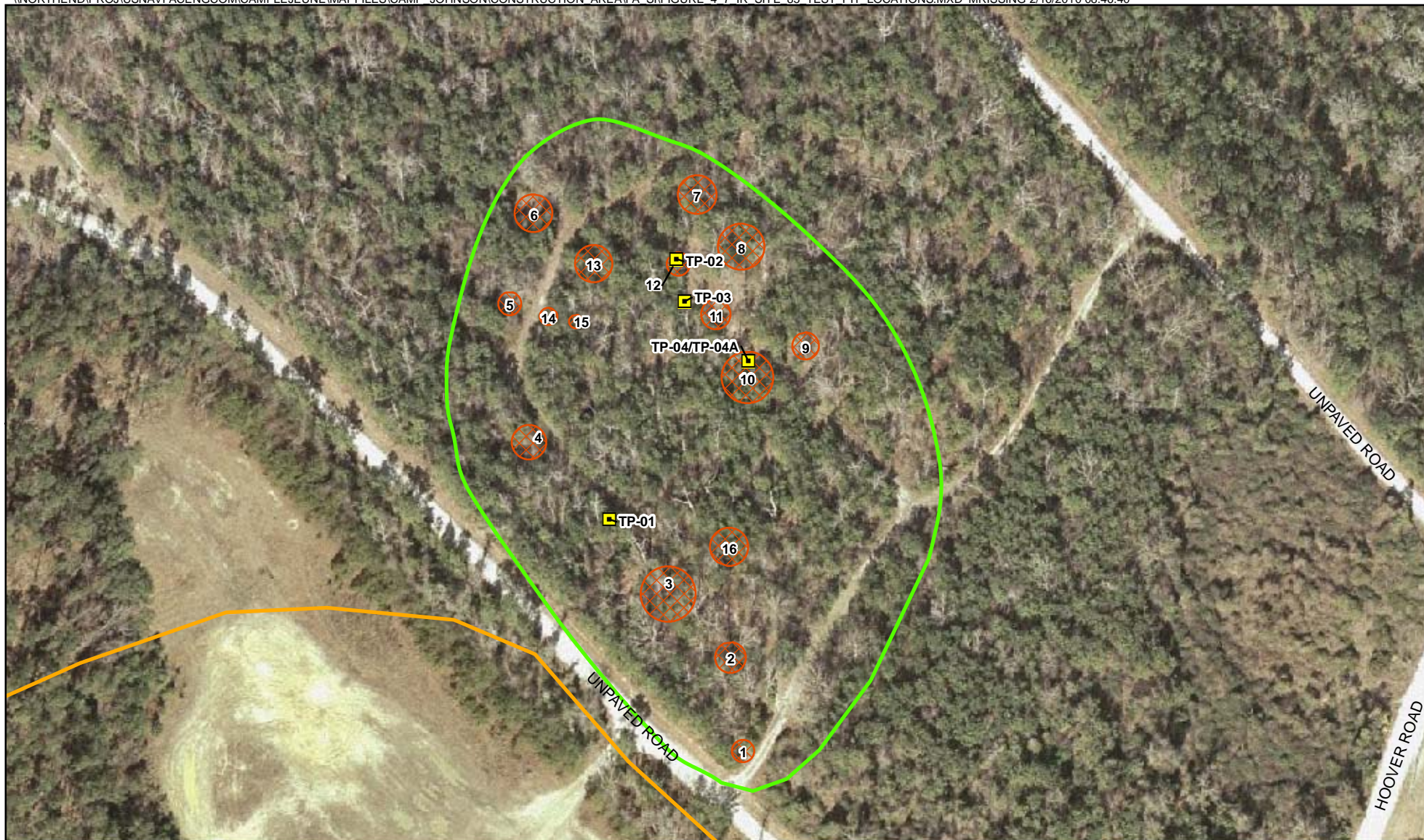


Figure 4-6  
IR Site 15 Test Pit Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







# Legend

- Test Pit
- ⊗ Former Battery Pile
- Approximate Former IR Site 85 Boundary
- IR Site 15 Boundary

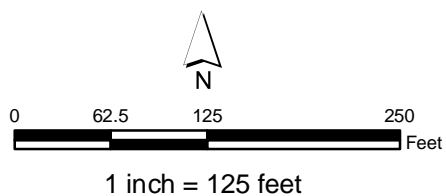


Figure 4-7  
IR Site 85 Test Pit Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina





# Results

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The following subsections present and summarize the findings of the field investigation discussed in Section 4. The laboratory analytical test results for surface soil, subsurface soil, and groundwater for the CJCA are presented in this section. Laboratory analytical reports and COC records are provided in **Appendix D**.

## 5.1 UXO 20

### 5.1.1 Surface Soil

The analytical data for the 214 surface soil samples collected from UXO-20 are presented in **Tables 5-1a** and **5-1b** (due to the size of the data set). **Figure 5-1** illustrates the distribution of the sample locations where target analytes exceeded the North Carolina Soil Screening Limits (NCSSLs), EPA Adjusted Residential Regional Screening Levels (RSLs), and/or EPA Adjusted Industrial RSLs and twice the mean Base background. The EPA Residential/Industrial RSLs are adjusted for non-cancer causing compounds to account for exposure to multiple constituents.

- Arsenic was detected in 201 surface soil samples at concentrations ranging from 0.22 mg/kg (CJCA-SS22) to 6.9 mg/kg (CJCA-SS136). The concentration of arsenic detected in 136 of the surface soil samples exceeded the EPA Adjusted Residential RSL and twice the mean Base background. Arsenic was also reported to exceed the EPA Adjusted Industrial RSL and twice the mean Base background in 25 surface soil samples. Arsenic was detected at concentrations exceeding the NCSSL and twice the mean Base background in surface soil samples collected from CJCA-SS72 and CJCA-SS136.
- No other metals were detected at concentrations exceeding regulatory screening criteria and twice the Base background.

### 5.1.2 Subsurface Soil

The analytical data for the 77 subsurface soil samples collected from UXO-20 are presented in **Table 5-2**. **Figure 5-2** illustrates the distribution of the sample locations where target analytes exceeded the North Carolina Soil Screening Limits (NCSSLs), EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- Arsenic was detected in 68 subsurface soil samples at concentrations ranging from 0.17 mg/kg (CJCA-SB014) to 46.5 mg/kg (CJCA-SB71). The concentrations of arsenic detected in 15 samples exceeded the EPA Adjusted RSLs and twice the mean Base background. Arsenic concentrations detected in 15 subsurface soil samples exceeded the NCSSL and twice the mean Base background concentration.
- No other metals were detected at concentrations exceeding regulatory screening criteria and twice the mean Base background.



### 5.1.3 Groundwater

Analytical data for the 37 groundwater samples collected from UXO-20 are presented in **Table 5-3**. **Figure 5-2** illustrates the distribution of the sample locations where target analytes exceeded the lower of the NCGWQS and maximum contaminant levels (MCLs) and/or EPA Adjusted tap water RSLs, and twice the mean Base background..

- Arsenic was detected in 12 groundwater samples at concentrations ranging from 2.2J micrograms per liter (µg/L) (CJCA-TW08) to 9.4J µg/L (CJCA-TW27). The concentration of arsenic detected in the groundwater samples collected from CJCA-TW27 and CJCA-TW30 exceeded the EPA Adjusted Tap Water RSL and twice the mean Base background.
- Lead was detected in 12 groundwater samples at concentrations ranging from 2 µg/L (CJCA-TW26 and CJCA-TW36) to 19.1 µg/L (CJCA-TW01). The concentration of lead detected in the groundwater sample collected from CJCA-TW01 exceeded the NCGWQS and twice the mean Base background concentration.

## 5.2 IR Site 15

### 5.2.1 Surface Soil

Analytical data for the 10 surface soil samples collected from Site 15 are presented in **Table 5-4**. **Figure 5-3** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- VOCs and SVOCs were not detected at concentrations exceeding NCSSLs or EPA RSLs in surface soil samples collected at Site 15.
- One PCB, aroclor-1254, was detected at a concentration exceeding the EPA Adjusted Industrial RSL in the surface soil sample collected at IR15-SS01.
- Concentrations of dieldrin were detected above the NCSSL at surface soil sample locations IR15-SS09 and IR15-SS10. However, the detected concentrations did not exceed the EPA Adjusted RSLs.
- Aluminum was detected in the 10 surface soil samples at concentrations ranging from 1,150 mg/kg (IR15-SS05) to 12,500 mg/kg (IR15-SS03). The concentration of aluminum was detected above the EPA Adjusted Residential RSL and twice the mean Base background in the surface soil sample collected from IR15-SS03.
- Arsenic was detected in the 10 surface soil samples at concentrations ranging from 0.24 mg/kg (IR15-SS05) to 4.7 mg/kg (IR15-SS03). Concentrations of arsenic exceeding EPA Adjusted Residential RSL and twice the mean Base background were reported at surface soil sample locations IR15-SS02 and IR15-SS04. The concentration of arsenic reported in surface soil samples collected from IR15-SS01, IR15-SS03, IR15-SS08, IR15-SS09, and IR15-SS10 exceeded the EPA Adjusted Industrial RSL and twice the mean Base background concentration.



- Chromium was detected in the 10 surface soil samples at concentrations ranging from 1.7 mg/kg (IR15-SS05) to 17.2 mg/kg (IR15-SS03), and exceeded the EPA Adjusted RSLs, the NCSSL, and twice the mean Base background, at surface soil sample locations IR15-SS01, IR15-SS03, IR15-SS08, IR15-SS09, and IR15-SS10.
- Iron was detected in the 10 surface soil samples at concentrations ranging from 903 mg/kg (IR15-SS06) to 10,200 mg/kg (IR15-SS03). Concentrations of iron detected at surface soil sample locations IR15-SS01, IR15-SS03, IR15-SS08, IR15-SS09, and IR15-SS10 exceeded the NCSSL and twice the mean Base background. Iron was reported at concentrations exceeding the EPA Adjusted Residential RSL and twice the mean Base background at surface soil sample locations IR15-SS03 and IR15-SS09.
- No other metals were detected at concentrations exceeding regulatory screening criteria and twice the mean Base background.

## 5.2.2 Subsurface Soil

Analytical data from the 10 subsurface soil samples collected from IR15 are presented in **Table 5-5**. **Figure 5-3** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- VOCs, SVOCs, or PCBs were not detected in subsurface soil samples at concentrations exceeding regulatory screening criteria.
- One pesticide, dieldrin, was detected above the NCSSL in subsurface soil sample IR15-SB05 at a concentration of 2.3 micrograms per kilogram ( $\mu\text{g/kg}$ ).
- Arsenic was detected in nine subsurface soil samples at concentrations ranging from 0.38 mg/kg (IR15-SB06) to 16.6 mg/kg (IR15-SB09). The arsenic concentration detected in subsurface soil sample IR15-SB09 exceeded the NCSSL, the EPA Adjusted RSLs, and twice the mean Base background.
- Chromium was detected in the 10 subsurface soil samples at concentrations ranging from 1.1 mg/kg (IR15-SB08) to 52.4 mg/kg (IR15-SB09). The concentration of chromium detected in subsurface soil sample IR15-SB09 exceeded the NCSSL, the EPA Adjusted Industrial RSL, and twice the mean Base background.
- Iron was detected in the 10 subsurface soil samples at concentrations ranging from 153 mg/kg (IR15-SB08) to 179,000 mg/kg (IR15-SB09). Concentrations of iron reported in subsurface soil samples collected at IR15-SB01 and IR15-SB09 exceeded the NCSSL, the EPA Adjusted Residential RSL, and twice the mean Base background. Additionally, the iron concentration detected at IR15-SB09 exceeded the EPA Adjusted Industrial RSL.
- Lead was detected in the 10 subsurface soil samples at concentrations ranging from 2.7 mg/kg (IR15-SB06) to 483 mg/kg (IR15-SB01). The concentration of lead detected in subsurface soil sample IR15-SB01 exceeded the NCSSL, the EPA Adjusted Residential RSL, and twice the mean Base background.
- Manganese was detected in the 10 subsurface soil samples at concentrations ranging from 1.5 mg/kg (IR15-SB08) to 626 mg/kg (IR15-SB09), and exceeded the NCSSL and



twice the mean Base background at subsurface soil sample locations IR15-SB01 and IR15-SB09.

### 5.2.3 Groundwater

- Analytical data for the five groundwater samples collected at Site 15 are presented in **Table 5-6**. **Figure 5-3** illustrates the distribution of the sample locations where target analytes exceeded the lower of the NCGWQS and maximum contaminant levels (MCLs) and/or EPA Adjusted tap water RSLs, and twice the mean Base background. VOCs, SVOCs, organochlorine pesticides (OCPs), and PCBs were not detected in the groundwater samples above the regulatory screening criteria.
- Chromium was detected in two groundwater samples at concentrations of 1.7J µg/L (IR15-TW03) and 5J µg/L (IR15-TW05). The sample collected from IR15-TW05 exceeded the EPA Adjusted Tap Water RSL and twice the Base background.
- Iron was detected in the five groundwater samples at concentrations ranging from 1,040 µg/L (IR15-TW05) to 25,800 µg/L (IR15-TW01), and exceeded, the NCGWQS, the EPA Adjusted Tap Water, and twice the mean Base background in the groundwater samples collected from IR15-TW01, IR15-TW03, and IR15-TW04.
- Manganese was detected in the five groundwater samples at concentrations ranging from 5.2 µg/L (IR15-TW05) to 439 µg/L (IR15-TW01). The sample collected from IR15-TW01 exceeded the NCGWQS, the EPA Adjusted Tap Water RSL, and twice the mean Base background.

## 5.3 IR Site 17

### 5.3.1 Surface Soil

Analytical data for the five surface soil samples collected from Site 17 are presented in **Table 5-7**. **Figure 5-4** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- VOCs, SVOCs, OCPs, and PCBs were not detected at concentrations exceeding NCSSLs or EPA RSLs.
- Arsenic was detected in the five surface soil samples at concentrations ranging from 1.1 mg/kg (IR17-SS05) to 4.9 mg/kg (IR17-SS01), and exceeded the EPA Adjusted Residential RSL and twice the mean Base background. Arsenic was also detected at concentrations exceeding the EPA Adjusted Industrial RSL and twice the Base background at soil sample locations IR17-SS01, IR17-SS03, and IR17-SS04.
- Chromium was detected in five surface soil samples at concentrations ranging from 2.7 mg/kg (IR17-SS05) to 8.5 mg/kg (IR17-SS01). The chromium concentration detected in surface soil sample IR17-SS01 exceeded the NCSSL, EPA Adjusted RSLs, and twice the mean Base background.
- Iron was detected in the five surface soil samples at concentrations ranging from 1,670 mg/kg (IR17-SS04) to 7,640 mg/kg (IR17-SS01), but exceeded the EPA Adjusted



Residential RSL, the NCSSL, and twice the mean Base background in the surface soil sample collected from IR17-SS01.

- No other metals concentrations exceeded the regulatory criteria and twice the mean Base background.

### 5.3.2 Subsurface Soil

Analytical data for the five subsurface soil samples collected at Site 17 are presented in **Table 5-8**. **Figure 5-4** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- SVOCs, OCPs, and PCBs were not detected at concentrations exceeding regulatory criteria.
- One VOC (1,2-dibromo-3-chloropropane) was detected at a concentration of 1.6 µg/kg in the soil sample collected from IR17-SB01, which exceeded the NCSSL.
- Aluminum was detected in the five subsurface soil samples at concentrations ranging from 4,270 mg/kg (IR17-SB02) to 20,000 mg/kg (IR17-SB03), and exceeded the EPA Adjusted Residential RSL and twice the mean Base background in the subsurface soil samples collected from IR17-SB01 and IR17-SB03.
- Arsenic was detected in the five subsurface soil samples at concentrations ranging from 0.95 mg/kg (IR17-SB04) to 14.4 mg/kg (IR17-SB03). The concentrations of arsenic detected in subsurface soil samples collected at IR17-SB01, IR17-SB03, and IR17-SB04 exceeded the EPA Adjusted Industrial RSL and twice the mean Base background. Arsenic was also detected at concentrations above the NCSSL in the subsurface soil samples collected from IR17-SB01 and IR17-SB03.
- Chromium was detected in the five subsurface soil samples at concentrations ranging from 4.7 mg/kg (IR17-SB02) to 35.8 mg/kg (IR17-SB03) and exceeded the EPA Adjusted RSLs, the NCSSL, and twice the mean Base background at subsurface soil sample locations IR17-SB01 and IR17-SB03.
- Iron was detected in the five subsurface soil samples at concentrations ranging from 2,240 mg/kg (IR17-SB02) to 28,400 mg/kg (IR17-SB03). The concentrations of iron were reported to exceed the EPA Adjusted Residential RSL, the NCSSL, and twice mean Base background at subsurface soil sample locations IR17-SB01, IR17-SB03, and IR17-SB05.

### 5.3.3 Groundwater

The analytical data for the two groundwater samples collected at Site 17 are presented in **Table 5-9**. **Figure 5-4** illustrates the distribution of the sample locations where target analytes exceeded the lower of the NCGWQS and maximum contaminant levels (MCLs) and/or EPA Adjusted tap water RSLs, and twice the mean Base background.

- One VOC, methylene chloride, was detected in the groundwater sample collected from IR17-TW01 at a concentration of 4.4 µg/L, exceeding the EPA Adjusted Tap water RSL.



- SVOCs, OCPs, or PCBs were not detected in the groundwater samples at concentrations exceeding regulatory screening criteria.
- Metals were not detected in the groundwater samples at concentrations exceeding both twice the Base background and regulatory screening criteria.

## 5.4 IR Site 85

### 5.4.1 Surface Soil

Analytical data for the 13 surface soil samples collected at Site 85 are presented in **Table 5-10**. **Figure 5-5** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- VOCs, SVOCs, or PCBs were not detected at concentrations exceeding NCSSLs or EPA Adjusted RSLs.
- One OCP, dieldrin, was detected at a concentration above the NCSSL in the surface soil sample collected from IR85-SS17 (1.9 µg/kg).
- Antimony was detected in one surface soil sample (IR85-SS18) at a concentration of 5.9 mg/kg, exceeding twice the Base background and the EPA Adjusted Residential RSL.
- Arsenic was detected in 13 surface soil samples at concentrations ranging from 0.57 mg/kg (IR85-SS13) to 9.9 mg/kg (IR85-SS17). The concentration of arsenic was detected at concentrations exceeding the EPA Adjusted Residential RSL and twice the mean Base background in surface soil samples collected from IR85-SS06, IR85-SS07, IR85-SS08, IR85-SS09, IR85-SS10, IR85-SS11, IR85-SS12, IR85-SS14, and IR85-SS15. Arsenic was also reported at concentrations exceeding the EPA Adjusted Industrial RSL and twice the mean Base background in two surface soil samples, IR85-SS16 and IR85-SS18. The concentration of arsenic detected in the surface soil sample collected from IR85-SS17 exceeded the NCSSL and twice the mean Base background.
- Cadmium was detected in three surface soil samples at concentrations ranging from 0.59 mg/kg (IR85-SS15) to 3.5 mg/kg (IR85-SS18), and exceeded the NCSSL and twice the mean Base background surface soil sample collected from IR85-SS18.
- Chromium was detected in 12 surface soil samples at concentrations ranging from 2.7 mg/kg (IR85-SS09) to 8.5 mg/kg (IR85-SS18), and exceeded the NCSSL and twice the mean Base background in surface soil sample IR85-SS18.
- Iron was detected in 13 surface soil samples at concentrations ranging from 1,690 mg/kg (IR85-SS07) to 11,500 mg/kg (IR85-SS18). The concentrations of iron exceeded NCSSL and twice the mean Base background in surface soil samples collected from IR85-SS14, IR85-SS16, IR85-SS17, and IR85-SS18. Iron was also reported above the EPA Adjusted Residential RSL in surface soil sample IR85-SS18.
- Lead was detected in 13 surface soil samples at concentrations ranging from 4.8 mg/kg (IR85-SS06) to 614 mg/kg (IR85-SS18), and exceeded the EPA Adjusted Residential RSL,



NCSSL, and twice the mean Base background in the surface soil sample collected from IR85-SS18.

- Manganese was detected in the 13 surface soil samples at concentrations ranging from 5.9 mg/kg (IR85-SS11) to 10,700 mg/kg (IR85-SS17). Detected concentrations of manganese exceeded the EPA Adjusted Residential RSL, NCSSL, and twice the mean Base background in surface soil samples collected from IR85-SS15, IR85-SS16, IR85-SS17, and IR85-SS18. The concentration of manganese detected in the surface soil sample collected from IR85-SS17 also exceeded the EPA Adjusted Industrial RSL.
- Mercury was detected in 11 surface soil samples at concentrations ranging from 0.037 (IR85-SS09) to 8.8 mg/kg (IR85-SS18). Concentrations of mercury detected in surface soil samples IR85-SS15, IR85-SS17, and IR85-SS18 exceeded the NCSSL and twice the mean Base background. Mercury concentrations detected in surface soil samples IR85-SS17 and IR85-SS18 also exceeded the EPA Adjusted Residential RSL.
- Thallium was detected in two surface soil samples, IR85-SS16 (0.44 J mg/kg) and IR85-SS17 (18.7J mg/kg), and exceeded the EPA Adjusted Industrial RSL and twice the mean Base background in surface soil sample IR85-SS17.
- Zinc was detected in 11 surface soil samples at concentrations ranging from 4.2 mg/kg (IR85-SS11) to 5,600 mg/kg (IR85-SS17). Concentrations of zinc exceeded the NCSSL and twice the mean Base background in two surface soil samples, IR85-SS17 and IR85-SS18. The concentration of zinc detected in surface soil sample IR85-SS17 also exceeded the EPA Adjusted Residential RSL.

#### 5.4.2 Subsurface Soil

Analytical data for the 12 subsurface soil samples collected at Site 85 are presented in **Table 5-11**. **Figure 5-5** illustrates the distribution of the sample locations where target analytes exceeded the NCSSLs, EPA Adjusted RSLs, and/or EPA Adjusted Industrial RSLs and twice the mean Base background.

- SVOCs, OCPs, or PCBs were not detected at concentrations exceeding regulatory criteria.
- One VOC (1,2-dibromo-3-chloropropane) was detected at a concentration of 2.4 µg/kg in the subsurface soil sample collected from IR85-SB11, exceeding the NCSSL.
- Aluminum was detected in 10 subsurface soil samples at concentrations ranging from 2,560 mg/kg (IR85-SB17) to 12,000 mg/kg (IR85-SB09). The concentration of aluminum detected in sample IR85-SB09 exceeded the EPA Adjusted Residential RSL and twice the mean Base background.
- Arsenic was detected in 10 subsurface soil samples at concentrations ranging from 0.68J mg/kg (IR85-SB10) to 2.3 mg/kg (IR85-SB07). The concentration of arsenic detected in sample IR85-SB07 exceeded the EPA Adjusted Industrial RSL and twice the mean Base background.



### 5.4.3 Groundwater

Analytical data for the nine groundwater samples collected at Site 85 are presented in **Table 5-12**. **Figure 5-5** illustrates the distribution of the sample locations where target analytes exceeded the lower of the NCGWQS and maximum contaminant levels (MCLs) and/or EPA Adjusted tap water RSLs, and twice the mean Base background.

- SVOCs, OCPs, or PCBs were not detected in the groundwater samples at concentrations exceeding regulatory screening criteria.
- Methylene chloride, was detected in two groundwater samples at concentrations of 14 µg/L (IR85-TW06) and 190 µg/L (IR85-TW08), exceeding the NCGWQS and the EPA Adjusted Tap Water RSL.
- Aluminum was detected in nine groundwater samples at concentrations ranging from 110J µg/L (IR85-TW05) to 15,100 µg/L (IR85-TW06), and exceeded the EPA Adjusted Tap water RSL and twice the mean Base background in the groundwater sample collected from IR85-TW06.
- Chromium was detected in two groundwater samples at concentrations ranging from 1.8Jµg/L (IR85-TW08) to 18.9J µg/L (IR85-TW06). The chromium concentration detected in the groundwater sample collected from IR85-TW06 exceeded the EPA Adjusted Tap Water RSL and twice the mean Base background.
- Iron was detected in nine groundwater samples at concentrations ranging from 106 µg/L (IR85-MW05) to 6,900 µg/L (IR85-TW06). The iron concentration detected in the groundwater samples collected from IR85-TW05 and IR85-TW06 exceeded the EPA Adjusted Tap water RSL and twice the mean Base background.

### 5.4.4 Batteries

The analytical data for the waste characterization testing conducted on the battery sample collected at Site 85 are presented in **Table 5-13**. The TCLP analyses detected 11 metals in the battery sample. Only lead and mercury were detected at concentrations exceeding TCLP criteria.



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS001	CJCA-SS002	CJCA-SS003	CJCA-SS004	CJCA-SS005	CJCA-SS006	CJCA-SS007	CJCA-SS008	CJCA-SS009
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS001-09C	CJCA-SS002-09C	CJCA-SS003-09C	CJCA-SS004-09C	CJCA-SS005-09C	CJCA-SS006-09C	CJCA-SS007-09C	CJCA-SS008-09C	CJCA-SS009-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.447	--	41	3.1	1.6 U	1.8 U	16.4 U	1.6 U	16.4 U	17.5 U	17.8 UJ	17 UJ	1.7 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.64 J</u>	1.8 U	16.4 U	<u>0.6 J</u>	16.4 U	17.5 U	17.8 U	17 U	0.25 J
Copper	4.83	700	4,100	310	0.31 J	0.89 U	8.2 U	0.69 J	8.2 U	8.7 U	8.9 U	8.5 U	1.8
Lead	12.3	270	800	400	5.5	0.96	4.2 J	6	3 J	5.4 J	7.5 J	6 J	5.4
Zinc	10.8	1,200	31,000	2,400	2.1	1.8 U	16.4 U	2.7	16.4 U	8.2 J	7 J	17 U	3.4
Wet Chemistry													
pH	--	--	--	--	4.3	NA	NA	4.1	NA	NA	NA	3.8	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

**Bold text indicates exceedance of Adjusted Industrial Soil RSLs**

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS010	CJCA-SS011	CJCA-SS012	CJCA-SS013	CJCA-SS014	CJCA-SS015	CJCA-SS016	CJCA-SS017	CJCA-SS018	CJCA-SS019
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS010-09C	CJCA-SS011-09C	CJCA-SS012-09C	CJCA-SS013-09C	CJCA-SS014-09C	CJCA-SS015-09C	CJCA-SS016-09C	CJCA-SS017-09C	CJCA-SS018-09C	CJCA-SS019-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.7 U	1.9 UJ	1.7 U	17.1 U	1.7 U	1.6 U	1.6 U	1.6 UJ	1.6 UJ	1.6 UJ
Arsenic	0.626	5.8	1.6	0.39	1.7 U	<u>0.44 J</u>	<u>0.45 J</u>	17.1 U	0.34 J	1.6 U	<u>0.4 J</u>	<u>0.62 J</u>	<b><u>0.67 J</u></b>	0.26 J
Copper	4.83	700	4,100	310	0.83 U	0.99 J	0.5 J	8.5 U	0.26 J	1.8	1.3	0.79 J	0.94 J	0.95 J
Lead	12.3	270	800	400	0.54 J	9.5	3.9	6 J	3.8	4.1	6.4	4.7	3.2	5.9
Zinc	10.8	1,200	31,000	2,400	1.7 U	3.4 J	2.9	17.1 U	4.9	4.1	2.8	1.9 J	3.7 J	2.6 J
Wet Chemistry														
pH	--	--	--	--	NA	4.9	NA	NA	NA	4.4	NA	NA	NA	6.9

Notes:

Shading indicates exceedance of two times the mean base background concentration

**Bold box indicates exceedance of NCSSLs**

**Bold text indicates exceedance of Adjusted Industrial Soil RSLs**

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SS020	CJCA-SS021		CJCA-SS022	CJCA-SS023	CJCA-SS024	CJCA-SS025	CJCA-SS026	CJCA-SS027
Sample ID					CJCA-SS020-09C	CJCA-SS021-09C	CJCA-SS021D-09C	CJCA-SS022-09C	CJCA-SS023-09C	CJCA-SS024-09C	CJCA-SS025-09C	CJCA-SS026-09C	CJCA-SS027-09C
Sample Date					07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/08/09	07/07/09	07/07/09	07/08/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.447	--	41	3.1	1.6 UJ	1.6 UJ	1.6 U	1.6 U	16.9 U	1.6 U	1.6 U	1.6 U	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.53 J</u>	0.22 J	0.29 J	<u>0.68 J</u>	16.9 U	0.29 J	<u>0.5 J</u>	<u>0.42 J</u>	<u>0.64 J</u>
Copper	4.83	700	4,100	310	1.2 J	1.2 J	1.2 J	0.83 J	8.5 U	1.4 J	2.7	0.83 J	0.51 J
Lead	12.3	270	800	400	5.4	11.1	11.8	6.4	3.8 J	3.9	8.3	5.4	5.2
Zinc	10.8	1,200	31,000	2,400	5.7	7.7	7	2.4 J	16.9 U	5.6	17.6	4.3	8.6
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	NA	NA	5.4	NA	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

**Bold text indicates exceedance of Adjusted Industrial Soil RSLs**

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS028	CJCA-SS029	CJCA-SS030	CJCA-SS031	CJCA-SS032	CJCA-SS033	CJCA-SS034	CJCA-SS035
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS028-09C	CJCA-SS029-09C	CJCA-SS030-09C	CJCA-SS031-09C	CJCA-SS032-09C	CJCA-SS033-09C	CJCA-SS034-09C	CJCA-SS035-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/08/09	07/08/09	07/08/09	07/08/09
Chemical Name												
Total Metals (mg/kg)												
Antimony	0.447	--	41	3.1	1.7 U	1.6 UJ	1.6 U	1.5 U	1.6 U	1.8 U	1.6 U	1.5 U
Arsenic	0.626	5.8	1.6	0.39	0.33 J	1.6 U	<u>0.43 J</u>	0.38 J	0.39 J	<b>2.8</b>	<u>0.7 J</u>	0.36 J
Copper	4.83	700	4,100	310	1.5 J	0.69 J	2.2	2.3	1.6 J	26.1	1.2 J	2.8
Lead	12.3	270	800	400	9.7	5.3	10.1	10.2	18.1	115	5.8	41
Zinc	10.8	1,200	31,000	2,400	10.2	1.9 J	33	6.8	14.9	42.8	4.6	3.2 J
Wet Chemistry												
pH	--	--	--	--	7.8	NA	NA	NA	7	NA	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

**Bold text indicates exceedance of Adjusted Industrial Soil RSLs**

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS036	CJCA-SS037	CJCA-SS038	CJCA-SS039	CJCA-SS040	CJCA-SS041		CJCA-SS042	CJCA-SS043	CJCA-SS044
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS036-09C	CJCA-SS037-09C	CJCA-SS038-09C	CJCA-SS039-09C	CJCA-SS040-09C	CJCA-SS041-09C	CJCA-SS041D-09C	CJCA-SS042-09C	CJCA-SS043-09C	CJCA-SS044-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.5 U	1.7 U	1.8 U	1.6 U	1.6 U	1.6 UJ	1.6 UJ	1.7 UJ	1.7 U	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.56 J</u>	<u>1.4 J</u>	<b>2.4</b>	<u>0.78 J</u>	<u>1.1 J</u>	<u>0.63 J</u>	<u>0.62 J</u>	<u>1.2 J</u>	<b>1.9</b>	<u>1.4 J</u>
Copper	4.83	700	4,100	310	0.62 J	8.4	7.2	1.6 J	1.5 J	4.1	4.7	4.7	4.8	2.6
Lead	12.3	270	800	400	4.4	6.4	18.3	5.3	10.5	8.1	10.5	13	16.2	10.2
Zinc	10.8	1,200	31,000	2,400	2.1 J	17	20.3	4.7	16.3	117	108	19.1	31.4	15.3
Wet Chemistry														
pH	--	--	--	--	NA	NA	5.9	NA	NA	NA	NA	NA	NA	7.9

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

**Bold text indicates exceedance of Adjusted Industrial Soil RSLs**

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

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mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SS045	CJCA-SS046		CJCA-SS047	CJCA-SS048	CJCA-SS049	CJCA-SS050	CJCA-SS051	CJCA-SS052
Sample ID					CJCA-SS045-09C	CJCA-SS046-09C	CJCA-SS046D-09C	CJCA-SS047-09C	CJCA-SS048-09C	CJCA-SS049-09C	CJCA-SS050-09C	CJCA-SS051-09C	CJCA-SS052-09C
Sample Date					07/09/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.447	--	41	3.1	1.6 U	0.26 J	0.4 J	1.6 U	1.6 UJ	1.6 U	1.7 UJ	1.7 U	1.8 U
Arsenic	0.626	5.8	1.6	0.39	0.94 J+	1.2 J	1.2 J	0.98 J	0.33 J	1.1 J	0.74 J	1.7 U	1.8 J
Copper	4.83	700	4,100	310	0.86 J	2.5	2.3	0.81 J	2.2	0.66 J	1 J	1.7 U	0.6 J
Lead	12.3	270	800	400	8.5	4.5	4.4	5	13	7.7	7.4	0.74 J	6.5
Zinc	10.8	1,200	31,000	2,400	5.1	8.2	10.4	3.3 J	49	2.3 J	6.7	0.86 J	3.1 J
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	NA	5	NA	NA	NA	5.1

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TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SS053		CJCA-SS054		CJCA-SS055	CJCA-SS056		CJCA-SS057	CJCA-SS058
Sample ID					CJCA-SS053-09C	CJCA-SS053D-09C	CJCA-SS054-09C	CJCA-SS054D-09C	CJCA-SS055-09C	CJCA-SS056-09C	CJCA-SS056D-09C	CJCA-SS057-09C	CJCA-SS058-09C
Sample Date					07/08/09	07/08/09	07/08/09	07/08/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.447	--	41	3.1	1.8 U	1.8 U	1.6 U	1.6 U	1.7 U	1.7 UJ	1.7 UJ	1.7 U	1.7 UJ
Arsenic	0.626	5.8	1.6	0.39	<u>1.1 J</u>	<u>1.3 J</u>	<b>2.7</b>	<b>1.8</b>	<u>0.48 J</u>	<u>1.4 J</u>	<b>1.8</b>	<u>1.2 J</u>	<u>1.1 J</u>
Copper	4.83	700	4,100	310	0.84 J	1.1 J	1.3 J	1.2 J	0.52 J	1.4 J	1.4 J	1.7	1.7 J
Lead	12.3	270	800	400	6.6	7.6	5.3	5	4.3	11.6	12.2	14.4	12.1
Zinc	10.8	1,200	31,000	2,400	3.5 J	4.3 J	3.3 J	3.3 J	1.3 J	4.6	4.5	7.7	4.5
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	4.6

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TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS059	CJCA-SS060	CJCA-SS061	CJCA-SS062	CJCA-SS063	CJCA-SS064	CJCA-SS065	CJCA-SS066	CJCA-SS067	CJCA-SS068
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS059-09C	CJCA-SS060-09C	CJCA-SS061-09C	CJCA-SS062-09C	CJCA-SS063-09C	CJCA-SS064-09C	CJCA-SS065-09C	CJCA-SS066-09C	CJCA-SS067-09C	CJCA-SS068-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/08/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.6 UJ	1.6 UJ	0.21 J-	0.22 J-	1.7 UJ	1.8 U	1.7 UJ	1.6 U	1.7 U	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<b>1.7</b>	<u>1.1</u> J	<u>1.3</u> J	<u>1.1</u> J+	<u>1.3</u> J+	<u>0.7</u> J+	<u>1.1</u> J+	<u>1.5</u> J+	<b>2.6</b> J+	<b>1.8</b> J+
Copper	4.83	700	4,100	310	2	0.76 J	1.3 J	1.2 J	1.7 J	0.6 J	1.4 J	0.67 J	0.62 J	1.2 J
Lead	12.3	270	800	400	10.9	5.8	4.2	3.9	6.4	4.8	11.5	6.7	5.5	6.6
Zinc	10.8	1,200	31,000	2,400	6.2	1.5 J	25.2	4.9	5.2	9.3	5.6	2.2 J	2.7 J	3.6 J
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	4.4	NA	NA	4.6	NA	4.6

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TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SS069	CJCA-SS070		CJCA-SS071	CJCA-SS072	CJCA-SS073	CJCA-SS074	CJCA-SS075	CJCA-SS076	CJCA-SS077
Sample ID					CJCA-SS069-09C	CJCA-SS070-09C	CJCA-SS070D-09C	CJCA-SS071-09C	CJCA-SS072-09C	CJCA-SS073-09C	CJCA-SS074-09C	CJCA-SS075-09C	CJCA-SS076-09C	CJCA-SS077-09C
Sample Date					07/09/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/09/09	07/09/09	07/08/09	07/09/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.6 U	1.7 UJ	1.7 UJ	1.7 UJ	1.7 UJ	1.8 U	0.24 J-	0.18 J-	1.7 U	1.6 UJ
Arsenic	0.626	5.8	1.6	0.39	<u>0.76 J+</u>	<u>1 J</u>	<u>0.98 J</u>	<u>1.7 J</u>	<b>6.7</b>	<u>0.88 J</u>	<u>0.94 J+</u>	<u>0.5 J+</u>	<u>0.42 J</u>	0.39 J+
Copper	4.83	700	4,100	310	0.44 J	0.54 J	0.62 J	0.79 J	2	0.61 J	0.76 J	0.62 J	0.37 J	0.26 J
Lead	12.3	270	800	400	5.6	6.3	7.3	7.3	9	5.1	6.2	3.8	2.5	3.9
Zinc	10.8	1,200	31,000	2,400	6.7	4.2 U	4.2 U	4.2 U	5.6	1.8 J	3.2 J	2 J	2.4 J	1.1 J
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	4.9	NA	NA	NA

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TABLE 5-1a  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS078	CJCA-SS079	CJCA-SS080		CJCA-SS081	CJCA-SS082	CJCA-SS083	CJCA-SS084	CJCA-SS085	CJCA-SS086
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS078-09C	CJCA-SS079-09C	CJCA-SS080-09C	CJCA-SS080D-09C	CJCA-SS081-09C	CJCA-SS082-09C	CJCA-SS083-09C	CJCA-SS084-09C	CJCA-SS085-09C	CJCA-SS086-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/09/09	07/08/09	07/09/09	07/09/09	07/09/09	07/08/09	07/09/09	07/09/09	07/07/09	07/07/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.7 UJ	1.8 UJ	1.7 UJ	1.6 UJ	1.8 UJ	1.6 UJ	1.6 UJ	0.22 J-	1.7 U	1.7 UJ
Arsenic	0.626	5.8	1.6	0.39	<u>1.6 J+</u>	<u>0.76 J</u>	<u>1.1 J+</u>	<u>0.93 J+</u>	<u>1.3 J+</u>	<u>1 J</u>	<u>1.1 J+</u>	<u>1 J+</u>	<u>0.95 J</u>	<u>0.86 J</u>
Copper	4.83	700	4,100	310	0.98 J	0.51 J	0.72 J	0.69 J	1.6 J	0.56 J	0.73 J	0.71 J	0.36 J	0.57 J
Lead	12.3	270	800	400	7.7	4.6	5.8	5.9	10.3	5.7	7.7	7.5	7.1	6.1
Zinc	10.8	1,200	31,000	2,400	2.6 J	4.5 U	1.9 J	1.6 J	4.8	3.9 U	2.6 J	1.5 J	1.6 J	1.5 J
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	4.5	NA	NA	4.1

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UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS087	CJCA-SS088	CJCA-SS089	CJCA-SS090	CJCA-SS091	CJCA-SS092		CJCA-SS093	CJCA-SS094	CJCA-SS095
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS087-09C	CJCA-SS088-09C	CJCA-SS089-09C	CJCA-SS090-09C	CJCA-SS091-09C	CJCA-SS092-09C	CJCA-SS092D-09C	CJCA-SS093-09C	CJCA-SS094-09C	CJCA-SS095-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.6 UJ	1.7 U	1.7 UJ	1.8 UJ	1.6 UJ	1.6 U	1.7 UJ	1.7 UJ	1.7 UJ	1.7 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.97 J</u>	<u>0.89 J</u>	<u>1.1 J</u>	<u>1.5 J</u>	<u>0.91 J</u>	<u>0.83 J</u>	<u>0.84 J</u>	<b>2.1</b>	<u>0.95 J</u>	<u>1 J</u>
Copper	4.83	700	4,100	310	1 J	1.4 J	0.83 J	0.93 J	0.38 J	0.57 J	0.63 J	3.2	1.1	0.6 J
Lead	12.3	270	800	400	7	6.3	6.8	7.2	5	9.8	8.1	9.6	6.6	6.6
Zinc	10.8	1,200	31,000	2,400	1.2 J	3.1 J	2.1 J	2.4 J	1.9	1.8 J	1.8 J	21.2	2.6	2
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	NA	4.3	4.3	NA	NA	NA

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Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS096	CJCA-SS097	CJCA-SS098	CJCA-SS099	CJCA-SS100	CJCA-SS101	CJCA-SS102	CJCA-SS103	CJCA-SS104
Sample ID	Background SS	(January,	Industrial Soil	Residential	CJCA-SS096-09C	CJCA-SS097-09C	CJCA-SS098-09C	CJCA-SS099-09C	CJCA-SS100-09C	CJCA-SS101-09C	CJCA-SS102-09C	CJCA-SS103-09C	CJCA-SS104-09C
Sample Date	2X Mean	2010)	RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.447	--	41	3.1	1.7 UJ	1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 U	1.7 UJ	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.9 J</u>	<b>2</b>	<u>0.67 J</u>	<u>1.5 J</u>	<u>1.1 J+</u>	<u>1 J</u>	<u>1.1 J</u>	<u>1.3 J+</u>	<u>1.6 J</u>
Copper	4.83	700	4,100	310	0.82 J	5.6	0.67 J	0.71 J	0.47 J	0.55 J	0.55 J	0.93 J	1.3 J
Lead	12.3	270	800	400	5.7	18	4.4	8	6.7	9.1	6.2	9.8	10.6
Zinc	10.8	1,200	31,000	2,400	2.4	6.1	1.7 J	2.6 J	1.9 J	2.5 J	2.2 J	2.4 J	4.4
Wet Chemistry													
pH	--	--	--	--	NA	5	NA	NA	4.4	NA	NA	4	NA

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UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SS105		CJCA-SS106	CJCA-SS107	CJCA-SS108	CJCA-SS109
Sample ID					CJCA-SS105-09C	CJCA-SS105D-09C	CJCA-SS106-09C	CJCA-SS107-09C	CJCA-SS108-09C	CJCA-SS109-09C
Sample Date					07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09
Chemical Name										
Total Metals (mg/kg)										
Antimony	0.447	--	41	3.1	1.7 UJ	1.7 UJ	1.6 U	1.7 U	1.6 U	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<b><u>1.8 J+</u></b>	<b><u>1.5 J+</u></b>	<b><u>1.7 J+</u></b>	<b><u>1.2 J+</u></b>	<b><u>1.3 J+</u></b>	0.35 J+
Copper	4.83	700	4,100	310	7.8	4.8	0.95 J	0.96 J	0.8 J	0.43 J
Lead	12.3	270	800	400	6.6	6.4	7.1	8.2	5.6	2.9
Zinc	10.8	1,200	31,000	2,400	17.8	10.8	2.5 J	2 J	2.7 J	1.6 J
Wet Chemistry										
pH	--	--	--	--	NA	NA	4.4	NA	NA	NA

Notes:

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UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

ph - pH units



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS110	CJCA-SS111	CJCA-SS112	CJCA-SS113	CJCA-SS114	CJCA-SS115	CJCA-SS116	CJCA-SS117	CJCA-SS118	CJCA-SS119	CJCA-SS120	CJCA-SS121
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS110-09C	CJCA-SS111-09C	CJCA-SS112-09C	CJCA-SS113-09C	CJCA-SS114-09C	CJCA-SS115-09C	CJCA-SS116-09C	CJCA-SS117-09C	CJCA-SS118-09C	CJCA-SS119-09C	CJCA-SS120-09C	CJCA-SS121-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/08/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.6 UJ	1.6 UJ	1.7 U	1.7 UJ	1.7 UJ	0.2 J-	1.6 U	1.8 U	1.6 UJ	1.8 U	1.6 U	1.6 U
Arsenic	0.626	5.8	1.6	0.39	<u>0.53</u> J	<u>0.41</u> J	<b>0.86</b> J+	<u>0.54</u> J	<b>1.5</b> J	<b>1.1</b> J+	<b>1.6</b> J	<b>1.4</b> J	<b>0.96</b> J+	<b>1.9</b>	<b>3.7</b>	<b>0.9</b> J
Copper	4.83	700	4,100	310	0.74 J	0.57 J	0.64 J	0.48 J	0.76 J	1.5 J	1.1 J	0.37 J	0.45 J	0.69 J	0.6 J	0.54 J
Lead	12.3	270	800	400	3.8	4	4.5	4.5	7.9	19.2	8.7	6.6	5.3	6	6	4.8
Zinc	10.8	1,200	31,000	2,300	4 U	4.1 U	2 J	4.2 U	4.1 U	3.7 J	2.6 J	1.9 J	2.1 J	2.5 J	1.5 J	4.1 U
Wet Chemistry																
pH (ph)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

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mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS122	CJCA-SS123	CJCA-SS124	CJCA-SS125	CJCA-SS126	CJCA-SS127	CJCA-SS128	CJCA-SS129	CJCA-SS130		CJCA-SS131	CJCA-SS132
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS122-09C	CJCA-SS123-09C	CJCA-SS124-09C	CJCA-SS125-09C	CJCA-SS126-09C	CJCA-SS127-09C	CJCA-SS128-09C	CJCA-SS129-09C	CJCA-SS130-09C	CJCA-SS130D-09C	CJCA-SS131-09C	CJCA-SS132-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/09/09	07/08/09	07/09/09	07/08/09	07/08/09	07/08/09	07/08/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.7 U	1.7 U	1.7 U	1.6 UJ	1.7 UJ	1.6 UJ	1.7 U	1.7 UJ	1.6 U	1.7 U	1.7 U	1.7 UJ
Arsenic	0.626	5.8	1.6	0.39	0.91 J	2.5	0.97 J	0.68 J	0.83 J	1.2 J	1.8	0.89 J	1.1 J	1.2 J	1.2 J	1.1 J
Copper	4.83	700	4,100	310	0.43 J	0.83 J	0.75 J	0.88	0.77 J	2.6	4.8	2.5	0.91 J	1.2 J	4.9	1.7
Lead	12.3	270	800	400	5.9	6.6	5.5	4.8	6	7.8	7.8	5.9	11.4	12.3	5.2	6.2
Zinc	10.8	1,200	31,000	2,300	1.6 J	2.1 J	4.2 U	1.9	2.3	7.3	6.4	7.4	4.1 U	4.4 U	11.2	7.1
Wet Chemistry																
pH (ph)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

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mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS133	CJCA-SS134	CJCA-SS135	CJCA-SS136	CJCA-SS137	CJCA-SS138		CJCA-SS139	CJCA-SS140		CJCA-SS141	CJCA-SS142
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS133-09C	CJCA-SS134-09C	CJCA-SS135-09C	CJCA-SS136-09C	CJCA-SS137-09C	CJCA-SS138-09C	CJCA-SS138D-09C	CJCA-SS139-09C	CJCA-SS140-09C	CJCA-SS140D-09C	CJCA-SS141-09C	CJCA-SS142-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/08/09	07/08/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/08/09	07/09/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.5 U	2.1 U	1.8 UJ	1.9 UJ	1.7 UJ	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UJ
Arsenic	0.626	5.8	1.6	0.39	1.3 J	1.8 J	2.1	6.9	2.1	1.3 J+	1.2 J+	1.1 J	1.5 J	1.7	1.7 U	0.93 J
Copper	4.83	700	4,100	310	1.1 J	1.8 J	1.1 J	1.2 J	1.1 J	0.77 J	0.81 J	0.6 J	2.9	2.5	1.7 U	0.8 J
Lead	12.3	270	800	400	6.9	9.2	7.5	11.4	6.7	5.8	6.3	6.2	12.8	14.1	0.71 J	6.1
Zinc	10.8	1,200	31,000	2,300	2.1 J	2.9 J	4.4 U	4.7 U	4.3 U	2.1 J	2.5 J	1.7 J	6.3	5.4	4.1 U	4.2 U
Wet Chemistry																
pH (ph)	--	--	--	--	NA	NA	NA	4.6	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

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mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS143	CJCA-SS144	CJCA-SS145	CJCA-SS146	CJCA-SS147	CJCA-SS148		CJCA-SS149	CJCA-SS150	CJCA-SS151	CJCA-SS152	CJCA-SS153
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS143-09C	CJCA-SS144-09C	CJCA-SS145-09C	CJCA-SS146-09C	CJCA-SS147-09C	CJCA-SS148-09C	CJCA-SS148D-09C	CJCA-SS149-09C	CJCA-SS150-09C	CJCA-SS151-09C	CJCA-SS152-09C	CJCA-SS153-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/09/09	07/08/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/10/09	07/09/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.7 U	1.6 U	0.22 J	1.6 U	1.7 UJ	1.7 UJ	1.7 UJ	0.19 J-	1.9 U	1.6 UJ	1.9 U	0.24 J-
Arsenic	0.626	5.8	1.6	0.39	0.82 J	0.97 J	0.62 J	1.1 J	1.3 J+	1.1 J	1.1 J	0.89 J	1.3 J	1 J	1.5 J	1.1 J+
Copper	4.83	700	4,100	310	0.54 J	0.78 J	0.85 J	1 J	0.84 J	0.79 J	1.3 J	0.85 J	0.93 J	1.1 J	1.3 J	0.92 J
Lead	12.3	270	800	400	5.1	8.3	5.1	5.4	5.2	6	6.3	9	11.5	5.9	14.3	28.3
Zinc	10.8	1,200	31,000	2,300	2.1 J	4.1 U	1.6 J	2 J	2.3 J	4.4 U	4.2 U	4.3 U	1.8 J	4.1 U	4.8 U	3.4 J
Wet Chemistry																
pH (ph)	--	--	--	--	NA	4.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS154	CJCA-SS155	CJCA-SS156	CJCA-SS157	CJCA-SS158	CJCA-SS159	CJCA-SS160	CJCA-SS161	CJCA-SS162	CJCA-SS163	
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS154-09C	CJCA-SS155-09C	CJCA-SS156-09C	CJCA-SS157-09C	CJCA-SS158-09C	CJCA-SS159-09C	CJCA-SS160-09C	CJCA-SS161-09C	CJCA-SS162-09C	CJCA-SS163-09C	CJCA-SS163D-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/10/09	07/09/09	07/09/09	07/09/09	07/09/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/08/09
Chemical Name															
Total Metals (mg/kg)															
Antimony	0.447	--	41	3.1	1.5 UJ	1.9 UJ	1.6 U	0.22 J-	1.6 UJ	1.7 U	1.7 U	1.6 UJ	1.7 UJ	0.47 J-	0.49 J-
Arsenic	0.626	5.8	1.6	0.39	<u>0.7</u> ↓	<b>2.1</b>	<u>1</u> ↓	<u>0.98</u> ↓	<u>1.1</u> ↓	<b>1.8</b>	<b>3</b>	<u>1.4</u> ↓	<u>1.1</u> ↓	<u>1.3</u> ↓	<u>1.2</u> ↓
Copper	4.83	700	4,100	310	0.52 J	1.5 J	0.62 J	0.85 J	2.2	3.4	1.1 J	1 J	0.51 J	1.2	1.2
Lead	12.3	270	800	400	5.1	8.2	8.1	<b>23.2</b>	6	<b>12.5</b>	8.6	6.7	7.2	6.1	5.9
Zinc	10.8	1,200	31,000	2,300	3.8 U	4.7 U	2 J	4.1 U	10.8	<b>17</b>	4.1 J	4.1 U	2.1	2.3	2.1
Wet Chemistry															
pH (ph)	--	--	--	--	NA	NA	NA	NA	7.5	NA	NA	NA	NA	NA	NA

Notes:

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mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS164		CJCA-SS165	CJCA-SS166	CJCA-SS167		CJCA-SS168	CJCA-SS169	CJCA-SS170	CJCA-SS171	CJCA-SS172	CJCA-SS173
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS164-09C	CJCA-SS164D-09C	CJCA-SS165-09C	CJCA-SS166-09C	CJCA-SS167-09C	CJCA-SS167D-09C	CJCA-SS168-09C	CJCA-SS169-09C	CJCA-SS170-09C	CJCA-SS171-09C	CJCA-SS172-09C	CJCA-SS173-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/09/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.6 UJ	0.18 J-	1.6 UJ	0.22 J-	1.6 UJ	1.6 UJ	1.6 U	1.7 U	1.7 UJ	1.6 UJ	1.6 UJ	1.7 UJ
Arsenic	0.626	5.8	1.6	0.39	<b>0.69 J</b>	<b>0.4 J</b>	<b>0.42 J</b>	<b>0.86 J</b>	<b>0.65 J</b>	<b>0.57 J</b>	<b>0.7 J</b>	<b>0.77 J</b>	<b>1.1 J</b>	<b>0.76 J</b>	<b>0.83 J</b>	<b>0.97 J</b>
Copper	4.83	700	4,100	310	0.78 J	0.85 J	0.57 J	1 J	0.96 J	0.85 J	0.86 J	0.61 J	0.62 J	0.69 J	0.5 J	0.58 J
Lead	12.3	270	800	400	4.8	4.7	5	5.5	6.4	6.5	5.1	6.1	4.9	5.9	4.9	4.1
Zinc	10.8	1,200	31,000	2,300	4 U	4.4 U	4 U	4 U	4.1 U	4 U	4.1 U	4.2 U	4.3 U	4 U	4.1 U	4.1 U
Wet Chemistry																
pH (ph)	--	--	--	--	NA	NA	4.1	4.4	NA	NA	NA	NA	NA	NA	4.8	NA

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TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS174	CJCA-SS175		CJCA-SS176		CJCA-SS177	CJCA-SS178	CJCA-SS179	CJCA-SS180	CJCA-SS181	CJCA-SS182	CJCA-SS183
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS174-09C	CJCA-SS175-09C	CJCA-SS175D-09C	CJCA-SS176-09C	CJCA-SS176D-09C	CJCA-SS177-09C	CJCA-SS178-09C	CJCA-SS179-09C	CJCA-SS180-09C	CJCA-SS181-09C	CJCA-SS182-09C	CJCA-SS183-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/08/09	07/08/09	07/08/09	07/09/09	07/09/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09	07/08/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.7 UJ	1.8 UJ	1.7 UJ	1.7 UJ	1.8 UJ	1.7 UJ	1.7 UJ	1.8 U	1.6 U	1.7 U	1.6 U	1.7 U
Arsenic	0.626	5.8	1.6	0.39	0.96 J	1.6 J	2.1	1 J	1.6 J	0.71 J	3.3	1.1 J	0.93 J	0.99 J	1.8	1.1 J
Copper	4.83	700	4,100	310	1 J	1.2 J	1.2 J	0.64 J	0.91 J	1.2 J	1.9	0.85 J	0.35 J	0.84 J	0.98 J	1.1 J
Lead	12.3	270	800	400	6.2	5.5	5.7	4.4	4.7	6.8	10.7	6.1	5.1	6.5	7.9	7.4
Zinc	10.8	1,200	31,000	2,300	4.3 U	4.4 U	4.2 U	4.4 U	4.5 U	4.2 U	4.5	2.6 J	2.4 J	1.5 J	2.3 J	1.9 J
Wet Chemistry																
pH (ph)	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS184	CJCA-SS185	CJCA-SS186	CJCA-SS187	CJCA-SS188	CJCA-SS189	CJCA-SS190	CJCA-SS191	CJCA-SS192	CJCA-SS193		
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS184-09C	CJCA-SS185-09C	CJCA-SS186-09C	CJCA-SS186D-09C	CJCA-SS187-09C	CJCA-SS188-09C	CJCA-SS189-09C	CJCA-SS190-09C	CJCA-SS191-09C	CJCA-SS192-09C	CJCA-SS193-09C	CJCA-SS193D-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/08/09	07/09/09	07/08/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/09/09	07/08/09	07/08/09	07/08/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	1.6 U	1.7 UJ	1.7 U	1.7 U	1.8 U	1.5 UJ	1.6 U	1.6 U	1.5 UJ	1.7 U	0.32 J	1.6 U
Arsenic	0.626	5.8	1.6	0.39	1.3 J	1.2 J	1.4 J	1.2 J	0.81 J	0.43 J	1 J	0.52 J	0.79 J	0.63 J	0.78 J	1.1 J
Copper	4.83	700	4,100	310	1.5 J	0.93 J	0.83 J	0.84 J	0.86 J	0.39 J	0.45 J	0.41 J	0.57 J	0.57 J	14.8	14.5
Lead	12.3	270	800	400	8.6	5.8	5.9	6.2	5	5.5	5.4	4.3	4.8	5.1	5.1	5.4
Zinc	10.8	1,200	31,000	2,300	3.7 J	4.2 U	4.2 U	4.2 U	4.3 U	4.1	2.5 J	1.6 J	3.8 U	2.4 J	52.3	47.7
Wet Chemistry																
pH (ph)	--	--	--	--	NA	4.2	NA	NA	NA	4.6	NA	NA	4.8	NA	NA	NA

Notes:

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UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS194	CJCA-SS195	CJCA-SS196	CJCA-SS197	CJCA-SS198	CJCA-SS199	CJCA-SS200	CJCA-SS201	CJCA-SS202	CJCA-SS203		CJCA-SS204
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS194-09C	CJCA-SS195-09C	CJCA-SS196-09C	CJCA-SS197-09C	CJCA-SS198-09C	CJCA-SS199-09C	CJCA-SS200-09C	CJCA-SS201-09C	CJCA-SS202-09C	CJCA-SS203-09C	CJCA-SS203D-09C	CJCA-SS204-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/09/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09
Chemical Name																
Total Metals (mg/kg)																
Antimony	0.447	--	41	3.1	0.19 J-	1.6 UJ	1.6 U	1.6 UJ	1.7 UJ	1.7 UJ	1.6 UJ	1.6 UJ	1.8 U	1.6 UJ	1.7 UJ	1.6 UJ
Arsenic	0.626	5.8	1.6	0.39	<b>0.86</b> ↓	<b>1.6</b>	<b>0.98</b> ↓	<b>0.99</b> ↓	<b>1.1</b> ↓	<b>1.2</b> ↓	<b>0.92</b> ↓	<b>0.95</b> ↓	<b>1.4</b> ↓	<b>0.77</b> ↓	<b>0.57</b> ↓	<b>0.8</b> ↓
Copper	4.83	700	4,100	310	0.76 J	4.2	0.83 J	1.1 J	1.2 J	0.87 J	0.63 J	0.46 J	1.2	0.73 J	0.75 J	1.1 J
Lead	12.3	270	800	400	7.6	8.3	10.1	6.6	5.2	5.9	5.6	5.5	9.3	3.9	4.9	5.8
Zinc	10.8	1,200	31,000	2,300	4.1 U	<b>11.2</b>	4.1 U	4 U	4.2 U	4.2 U	1.9	3.1	2.6	1.1 J	1.3 J	2.2 J
Wet Chemistry																
pH (ph)	--	--	--	--	4.2	7.8	NA	4.6	4.1	4.5	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram



TABLE 5-1b  
UXO-20 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	CJCA-SS205	CJCA-SS206	CJCA-SS207	CJCA-SS208	CJCA-SS209	CJCA-SS210	CJCA-SS211	CJCA-SS212	CJCA-SS213	CJCA-SS214
Sample ID	Background SS	(January, 2010)	Industrial	Residential	CJCA-SS205-09C	CJCA-SS206-09C	CJCA-SS207-09C	CJCA-SS208-09C	CJCA-SS209-09C	CJCA-SS210-09C	CJCA-SS211-09C	CJCA-SS212-09C	CJCA-SS213-09C	CJCA-SS214-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/07/09	07/09/09	07/07/09	07/07/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.447	--	41	3.1	1.7 UJ	1.7 U	1.7 U	1.6 UJ	1.6 UJ	1.6 UJ	1.7 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Arsenic	0.626	5.8	1.6	0.39	<b>1.8</b>	<b>1.4</b> ↓	<b>0.82</b> ↓	<b>0.89</b> ↓	<b>0.98</b> ↓	<b>0.55</b> ↓	<b>0.78</b> ↓	<b>0.89</b> ↓	<b>0.74</b> ↓	<b>0.96</b> ↓
Copper	4.83	700	4,100	310	1 J	0.98	4.3	1.3 J	3.4	2.9	1.5 J	0.67 J	4.6	1.7
Lead	12.3	270	800	400	5.8	5.4	6.6	6	<b>14.1</b>	<b>12.9</b>	7.2	6	<b>16.6</b>	10.1
Zinc	10.8	1,200	31,000	2,300	2.6 J	2.4	4.5	7.3	<b>12.2</b>	<b>28.3</b>	3.8 J	4 U	<b>15.2</b>	5.5
Wet Chemistry														
pH (ph)	--	--	--	--	NA	NA	NA	NA	NA	8.1	NA	4.7	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB01	CJCA-SB02	CJCA-SB03	CJCA-SB04	CJCA-SB05	CJCA-SB06	CJCA-SB07	CJCA-SB08
Sample ID					CJCA-SB01-2-7-09C	CJCA-SB02-2-6-09C	CJCA-SB03-2-7-09C	CJCA-SB04-4-7-09C	CJCA-SB05-2-7-09C	CJCA-SB06-2-7-09C	CJCA-SB07-4-7-09C	CJCA-SB08-2-7-09C
Sample Date					07/26/09	07/29/09	07/26/09	07/29/09	07/26/09	07/29/09	07/26/09	07/29/09
Chemical Name												
Total Metals (mg/kg)												
Antimony	0.36	--	41	3.1	1.7 U	0.21 J-	1.9 U	1.6 UJ	1.7 U	1.5 UJ	1.5 U	1.6 UJ
Arsenic	2.12	5.8	1.6	0.39	<u>0.61</u> J	1.8 U	<u>0.57</u> J	<u>0.48</u> J	<u>0.67</u> J	<u>0.72</u> J	<u>0.51</u> J	<b>4.4</b>
Copper	2.56	700	4,100	310	0.28 J	1.4 J	0.55 J	0.48 J	0.77 J	0.47 J	0.51 J	0.72 J
Lead	8.49	270	800	400	3.4	4.2	4.3	2.6	3.3	1.9	1.8	4
Zinc	6.59	1,200	31,000	2,400	4.2 U	4.6 U	4.8 U	4.1 U	4.1 U	3.7 U	3.8 U	3.9 U
Wet Chemistry												
pH	--	--	--	--	NA	NA	3.6	NA	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
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mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB09		CJCA-SB10	CJCA-SB11	CJCA-SB12	CJCA-SB13	CJCA-SB14	CJCA-SB15	CJCA-SB16
Sample ID					CJCA-SB09-2-4-09C	CJCA-SB09D-2-4-09C	CJCA-SB10-2-6-09C	CJCA-SB11-2-7-09C	CJCA-SB12-2-7-09C	CJCA-SB13-2-7-09C	CJCA-SB14-2-7-09C	CJCA-SB15-6-7-09C	CJCA-SB16-2-7-09C
Sample Date					07/26/09	07/26/09	07/28/09	07/26/09	07/29/09	07/26/09	07/28/09	07/25/09	07/25/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.36	--	41	3.1	1.6 U	1.7 U	1.6 UJ	1.5 U	1.5 UJ	1.8 U	1.5 UJ	1.6 U	1.5 U
Arsenic	2.12	5.8	1.6	0.39	<u>1.3</u> J	<u>0.81</u> J	0.25 J	<u>1.3</u> J	<u>1.1</u> J	<u>1.2</u> J	0.17 J	3.8 U	1.5 U
Copper	2.56	700	4,100	310	3	6.9	0.64 J	0.55 J	0.58 J	0.51 J	0.27 J	1.3 J	0.77 J
Lead	8.49	270	800	400	4.7	4.5	2.5	2.5	2	2.6	1.6	6.2	3.1
Zinc	6.59	1,200	31,000	2,400	16	49	4 U	3.8 U	3.8 U	4.6 U	3.8 U	4.4	3.7 U
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	4.7	NA	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB18	CJCA-SB19	CJCA-SB20		CJCA-SB21	CJCA-SB22	CJCA-SB23	CJCA-SB24	CJCA-SB25
Sample ID					CJCA-SB18-2-5-09C	CJCA-SB19-2-7-09C	CJCA-SB20-2-7-09C	CJCA-SB20D-2-7-09C	CJCA-SB21-2-7-09C	CJCA-SB22-4-7-09C	CJCA-SB23-2-3-09C	CJCA-SB24-2-4-09C	CJCA-SB25-6-7-09C
Sample Date					07/25/09	07/28/09	07/25/09	07/25/09	07/28/09	07/25/09	07/28/09	07/24/09	07/28/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.36	--	41	3.1	1.7 U	1.6 UJ	1.7 U	1.8 U	1.5 UJ	1.5 U	1.6 UJ	1.6 U	1.9 UJ
Arsenic	2.12	5.8	1.6	0.39	1.7 U	<u>0.62 J</u>	1.7 U	2.6 U	<u>0.45 J±</u>	1.5 U	<u>0.79 J±</u>	1.6 U	<b>13.2 J±</b>
Copper	2.56	700	4,100	310	0.55 J	0.35 J	1.7 U	1.9	0.53 J	1.5 U	0.34 J	0.54 J	4.3
Lead	8.49	270	800	400	3.2	2.2	1.5 J	7	2.7	1.5	5	6.8	12.1
Zinc	6.59	1,200	31,000	2,400	2.1 J	3.9 U	4.1 U	4.1 U	3.8 U	3.7 U	3.9 U	6.5	9.6
Wet Chemistry													
pH	--	--	--	--	4.4	NA	NA	NA	NA	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB26	CJCA-SB27	CJCA-SB28	CJCA-SB29	CJCA-SB30	CJCA-SB31		CJCA-SB32	CJCA-SB33
Sample ID					CJCA-SB26-4-7-09C	CJCA-SB27-4-7-09C	CJCA-SB28-2-4-09C	CJCA-SB29-2-7-09C	CJCA-SB30-2-7-09C	CJCA-SB31-4-7-09C	CJCA-SB31D-4-7-09C	CJCA-SB32-2-7-09C	CJCA-SB33-4-6-09C
Sample Date					07/23/09	07/28/09	07/23/09	07/28/09	07/23/09	07/23/09	07/23/09	07/22/09	07/23/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.36	--	41	3.1	1.9 UJ	1.9 UJ	1.7 UJ	1.9 UJ	1.8 U	1.9 U	2 U	1.9 U	1.8 U
Arsenic	2.12	5.8	1.6	0.39	<b>6.9</b>	<b>8.9 J+</b>	<b>2.6</b>	<b>11</b>	<b>4.5 J-</b>	<b>13.7 J-</b>	<b>14.5 J-</b>	<b>15.8 J-</b>	<b>3.7 J-</b>
Copper	2.56	700	4,100	310	2.7 U	3.6	1.7 U	4.1	3.1	4	4.1	3.9	2.7
Lead	8.49	270	800	400	8.6	12.9	7.8	13.7	12.5	14.9	16.4	13.1	12
Zinc	6.59	1,200	31,000	2,400	6.9	8.3	4.3 U	7.6	5	7.8	7.2	8.3	7.4
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	4.2	NA	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
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Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB34	CJCA-SB35	CJCA-SB36	CJCA-SB37	CJCA-SB38	CJCA-SB39	CJCA-SB40	CJCA-SB41	CJCA-SB42
Sample ID					CJCA-SB34-2-4-09C	CJCA-SB35-2-4-09C	CJCA-SB36-4-7-09C	CJCA-SB37-6-7-09C	CJCA-SB38-2-4-09C	CJCA-SB39-2-4-09C	CJCA-SB40-4-7-09C	CJCA-SB41-4-6-09C	CJCA-SB42-2-7-09C
Sample Date					07/28/09	07/25/09	07/28/09	07/24/09	07/24/09	07/23/09	07/28/09	07/23/09	07/28/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.36	--	41	3.1	1.7 UJ	1.7 U	1.9 UJ	1.9 UJ	1.7 UJ	1.9 UJ	2 UJ	1.7 U	2 UJ
Arsenic	2.12	5.8	1.6	0.39	<b>20.8 J+</b>	1.7 U	<b>3.3 J+</b>	<b>4.2</b>	<b>2.6</b>	<b>13.1</b>	<b>7.4 J+</b>	<b>2.6 J-</b>	<b>17.7 J+</b>
Copper	2.56	700	4,100	310	3.6	0.99 J	2.2	3.5	1.8 U	2.6 U	4.1	1.3 J	4.2
Lead	8.49	270	800	400	9.7	13.6	11.2	10.4	7.5	11.9	14.6	8.2	14.2
Zinc	6.59	1,200	31,000	2,400	5.2	4.3 U	6.8	8.9	4.2 U	6.4	7.9	3.3 J	8.2
Wet Chemistry													
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	4.4	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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J+ - Analyte present, value may be biased high, actual value may be lower  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB43	CJCA-SB44	CJCA-SB45		CJCA-SB46	CJCA-SB47	CJCA-SB48	CJCA-SB49
Sample ID					CJCA-SB43-6-7-09C	CJCA-SB44-6-7-09C	CJCA-SB45-2-5-09C	CJCA-SB45D-2-5-09C	CJCA-SB46-4-7-09C	CJCA-SB47-6-7-09C	CJCA-SB48-4-6-09C	CJCA-SB49-2-4-09C
Sample Date					07/22/09	07/23/09	07/22/09	07/22/09	07/27/09	07/25/09	07/27/09	07/25/09
Chemical Name												
Total Metals (mg/kg)												
Antimony	0.36	--	41	3.1	1.9 U	2 U	1.8 U	1.8 U	2 UJ	1.9 U	1.8 UJ	1.6 U
Arsenic	2.12	5.8	1.6	0.39	<b>5.3 J-</b>	<b>17.8 J-</b>	<b>11.6 J-</b>	<b>2.9 J-</b>	<b>14.4 J+</b>	<b>6.5</b>	<b>5.7 J+</b>	3 U
Copper	2.56	700	4,100	310	3.2	4.7	4.4	2.1	2.5	2.5	2.2	1.3 J
Lead	8.49	270	800	400	12	14.5	16.1	11.1	11	11.9	8.7	7.6
Zinc	6.59	1,200	31,000	2,400	7.9	7.9	5	5.3	6.5	7.6	6.9	4.2
Wet Chemistry												
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	4.6	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB50		CJCA-SB51	CJCA-SB52	CJCA-SB53	CJCA-SB54	CJCA-SB55	CJCA-SB56	CJCA-SB57	CJCA-SB58
Sample ID					CJCA-SB50-4-6-09C	CJCA-SB50D-4-6-09C	CJCA-SB51-2-7-09C	CJCA-SB52-4-6-09C	CJCA-SB53-2-7-09C	CJCA-SB54-6-7-09C	CJCA-SB55-4-6-09C	CJCA-SB56-2-7-09C	CJCA-SB57-2-4-09C	CJCA-SB58-2-6-09C
Sample Date					07/27/09	07/27/09	07/25/09	07/27/09	07/22/09	07/22/09	07/22/09	07/27/09	07/23/09	07/27/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.36	--	41	3.1	1.7 UJ	1.7 UJ	1.8 U	1.7 UJ	1.8 U	1.8 U	1.9 U	1.7 UJ	1.7 U	1.8 UJ
Arsenic	2.12	5.8	1.6	0.39	<b>6 J+</b>	<b>4.6 J+</b>	<b>2.4</b>	<u>0.98 J+</u>	<b>21.1 J+</b>	<b>14.3 J+</b>	<b>9.2 J+</b>	<b>4.5 J+</b>	<b>2.3 J-</b>	<b>1.9 J+</b>
Copper	2.56	700	4,100	310	1.8	1.7	1.3 J	0.49 J	3.5	3.6	3	1.9	0.75 J	2
Lead	8.49	270	800	400	8.7	8.8	7.5	6.1	11.6	14	12.1	8.5	5.9	9
Zinc	6.59	1,200	31,000	2,400	5	5.5	4.4 U	4.2 U	7.7	6.3	5.7	4.4 U	3.3 J	5.3
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	4.3	NA	NA	NA	NA	4.4

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB59		CJCA-SB60	CJCA-SB61	CJCA-SB62	CJCA-SB63	CJCA-SB64		CJCA-SB65	CJCA-SB66
Sample ID					CJCA-SB59-2-4-09C	CJCA-SB59D-2-4-09C	CJCA-SB60-4-6-09C	CJCA-SB61-2-4-09C	CJCA-SB62-2-4-09C	CJCA-SB63-2-4-09C	CJCA-SB64-4-7-09C	CJCA-SB64D-4-7-09C	CJCA-SB65-2-4-09C	CJCA-SB66-4-6-09C
Sample Date					07/23/09	07/23/09	07/22/09	07/22/09	07/22/09	07/23/09	07/27/09	07/27/09	07/22/09	07/22/09
Chemical Name														
Total Metals (mg/kg)														
Antimony	0.36	--	41	3.1	1.8 U	1.8 U	1.8 U	1.6 U	1.8 U	1.6 U	1.9 UJ	2 UJ	1.7 U	2 U
Arsenic	2.12	5.8	1.6	0.39	<u>3.9 J-</u>	<u>3.5 J-</u>	<b>14.8 J+</b>	<u>1.1 J+</u>	<u>4.7 J+</u>	<u>2.6 J-</u>	<b>12 J+</b>	<b>15 J+</b>	<u>5.6 J-</u>	<u>12.3 J-</u>
Copper	2.56	700	4,100	310	3	2.3	4.6	1 J	3.2	0.65 J	4.6	4.2	0.84 J	2.9
Lead	8.49	270	800	400	11.5	10.1	17.3	4.9	10.8	5	14.4	13.3	7.2	9.7
Zinc	6.59	1,200	31,000	2,400	6.7	6.3	7.7	3.9 U	6.6	2 J	8.7	9	3.2 J	8.7
Wet Chemistry														
pH	--	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB67	CJCA-SB68	CJCA-SB69	CJCA-SB70		CJCA-SB71	CJCA-SB72	CJCA-SB73	CJCA-SB74
Sample ID					CJCA-SB67-6-7-09C	CJCA-SB68-4-6-09C	CJCA-SB69-6-7-09C	CJCA-SB70-4-6-09C	CJCA-SB70D-4-6-09C	CJCA-SB71-6-7-09C	CJCA-SB72-4-6-09C	CJCA-SB73-4-6-09C	CJCA-SB74-2-7-09C
Sample Date					07/22/09	07/22/09	07/21/09	07/22/09	07/22/09	07/21/09	07/21/09	07/21/09	07/21/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	0.36	--	41	3.1	1.9 U	1.8 U	2.1 U	2 U	1.9 U	3.7 U	1.9 U	1.9 U	1.7 U
Arsenic	2.12	5.8	1.6	0.39	<b>11.6 J-</b>	<b>11.6 J+</b>	<b>10.1 J-</b>	<b>14.2 J+</b>	<b>4.7 J+</b>	<b>46.5 J-</b>	<b>21.3 J-</b>	<b>14.1 J-</b>	<b>1.1 J-</b>
Copper	2.56	700	4,100	310	4.5	3.7	4	4	3.7	6.8	5.4	4.2	0.66 J
Lead	8.49	270	800	400	15.6	13.7	15.4	15.4	14.4	17.6	13.8	14	4
Zinc	6.59	1,200	31,000	2,400	8.2	7.4	7.9	8	8	9.7	8.4	8.9	4.2 U
Wet Chemistry													
pH	--	--	--	--	4.6	NA	NA	NA	NA	NA	NA	4.6	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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J+ - Analyte present, value may be biased high, actual value may be lower  
U - The material was analyzed for, but not detected  
UU - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-2  
UXO-20 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	CJCA-SB75	CJCA-SB76	CJCA-SB77	CJCA-SB78
Sample ID					CJCA-SB75-4-6-09C	CJCA-SB76-4-6-09C	CJCA-SB77-2-4-09C	CJCA-SB78-4-6-09C
Sample Date					07/21/09	07/21/09	07/21/09	07/21/09
Chemical Name								
Total Metals (mg/kg)								
Antimony	0.36	--	41	3.1	1.9 U	1.8 U	1.5 U	3.5 U
Arsenic	2.12	5.8	1.6	0.39	<b>7 J-</b>	<b>4.9 J-</b>	<u>0.92 J-</u>	<b>24.8 J-</b>
Copper	2.56	700	4,100	310	4.1	3.5	0.5 J	6.3
Lead	8.49	270	800	400	14.2	10.4	4.1	14.8
Zinc	6.59	1,200	31,000	2,400	8.1	5.4	3.8 U	10.2
Wet Chemistry								
pH	--	--	--	--	NA	NA	NA	NA

Notes:  
Shading indicates exceedance of two times the mean base background concentration for subsurface soil  
Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
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UU - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram



TABLE 5-3  
UXO-20 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NC2GWQS	Adjusted Tap	CJCA-TW01	CJCA-TW02	CJCA-TW03	CJCA-TW04	CJCA-TW05	CJCA-TW06	CJCA-TW08	CJCA-TW09	CJCA-TW10	CJCA-TW11	CJCA-TW12	CJCA-TW13	CJCA-TW14	CJCA-TW15	
Sample ID	Background GW 2X	(January, 2010)	Water RSLs	CJCA-TW01-09C	CJCA-TW02-09C	CJCA-TW03-09C	CJCA-TW04-09C	CJCA-TW05-09C	CJCA-TW06-09C	CJCA-TW08-09C	CJCA-TW09-09C	CJCA-TW10-09C	CJCA-TW11-09C	CJCA-TW12-09C	CJCA-TW13-09C	CJCA-TW14-09C	CJCA-TW15-09C	CJCA-TW15D-09C
Sample Date	Mean			07/28/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09	07/27/09	07/26/09	07/27/09	07/27/09	07/26/09	07/26/09	07/26/09	07/26/09	07/26/09
Chemical Name																		
Total Metals (µg/l)																		
Arsenic	5.77	10	0.045	20 U	20 U	20 U	3 J	20 U	20 U	2.2 J	20 U	2.6 J	20 U	20 U	20 U	2.9 J	20 U	20 U
Copper	2.76	1,000	150	100 U	20 U	7.4 J	20 U	20 U	3.2 J	20 U	4.4 J	20 U	20 U	20 U	3.9 J	20 U	20 U	3.5 J
Lead	2.8	15	--	19.1 J	20 U	14.1 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Zinc	42.1	1,000	1,100	250 U	18 J	18.5 J	4.5 J	18.2 J	8.4 J	6.9 J	14.3 J	10.4 J	18.6 J	6.5 J	17.4 J	36.8 J	6.9 J	14.2 J
Dissolved Metals (µg/l)																		
Arsenic	5.77	10	0.045	20 U	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	2.76	1,000	150	20 U	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	2.8	15	--	2 J	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	42.1	1,000	1,100	50 U	NA	10.1 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

**Bold text indicates exceedance of Adjusted Tap Water RSLs**

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

µg/l - micrograms per liter



TABLE 5-3  
UXO-20 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NC2GWQS	Adjusted Tap	CJCA-TW16	CJCA-TW17	CJCA-TW18	CJCA-TW19	CJCA-TW20	CJCA-TW21	CJCA-TW22	CJCA-TW23	CJCA-TW24		CJCA-TW25	CJCA-TW26	CJCA-TW27	CJCA-TW28	CJCA-TW29
Sample ID	Background GW 2X	(January, 2010)	Water RSLs	CJCA-TW16-09C	CJCA-TW17-09C	CJCA-TW18-09C	CJCA-TW19-09C	CJCA-TW20-09C	CJCA-TW21-09C	CJCA-TW22-09C	CJCA-TW23-09C	CJCA-TW24-09C	CJCA-TW24D-09C	CJCA-TW25-09C	CJCA-TW26-09C	CJCA-TW27-09C	CJCA-TW28-09C	CJCA-TW29-09C
Sample Date	Mean			07/25/09	07/24/09	07/26/09	07/26/09	07/26/09	07/26/09	07/24/09	07/23/09	07/27/09	07/27/09	07/27/09	07/27/09	07/23/09	07/23/09	07/25/09
Chemical Name																		
Total Metals (µg/l)																		
Arsenic	5.77	10	0.045	20 U	20 U	20 U	20 U	20 U	3.1 J	20 U	20 U	20 U	20 U	20 U	20 U	9.4 J	2.9 J	20 U
Copper	2.76	1,000	150	20 U	10.4 J	20 U	20 U	20 U	20 U	20 U	2.7 J	20 U	20 U	20 U	20 U	5.5 J	10 J	20 U
Lead	2.8	15	--	20 U	11.5 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	2 J	10.3 J	2.3 J	20 U
Zinc	42.1	1,000	1,100	32 J	160	112	7.5 J	81.5	21.2 J	5.6 J	69.8	11.6 J	14.8 J	14.3 J	11.9 J	63.5	56.7	15.1 J
Dissolved Metals (µg/l)																		
Arsenic	5.77	10	0.045	NA	20 U	NA	NA	NA	NA	20 U	20 U	NA	NA	NA	NA	20 U	20 U	NA
Copper	2.76	1,000	150	NA	20 U	NA	NA	NA	NA	20 U	20 U	NA	NA	NA	NA	20 U	3.6 J	NA
Lead	2.8	15	--	NA	20 U	NA	NA	NA	NA	2 J	20 U	NA	NA	NA	NA	20 U	20 U	NA
Zinc	42.1	1,000	1,100	NA	82.3	NA	NA	NA	NA	4.3 J	32.4 J	NA	NA	NA	NA	50 U	39.6 J	NA

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

**Bold text indicates exceedance of Adjusted Tap Water RSLs**

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

µg/l - micrograms per liter



TABLE 5-3  
UXO-20 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NC2GWQS	Adjusted Tap	CJCA-TW30	CJCA-TW31	CJCA-TW32	CJCA-TW33	CJCA-TW34	CJCA-TW35		CJCA-TW36	CJCA-TW37	CJCA-TW38
Sample ID	Background GW 2X	(January, 2010)	Water RSLs	CJCA-TW30-09C	CJCA-TW31-09C	CJCA-TW32-09C	CJCA-TW33-09C	CJCA-TW34-09C	CJCA-TW35-09C	CJCA-TW35D-09C	CJCA-TW36-09C	CJCA-TW37-09C	CJCA-TW38-09C
Sample Date	Mean			07/25/09	07/23/09	07/25/09	07/25/09	07/25/09	07/22/09	07/22/09	07/22/09	07/22/09	07/23/09
Chemical Name													
Total Metals (µg/l)													
Arsenic	5.77	10	0.045	6.1 J	4 J	2.6 J	3.5 J	20 U	20 U	20 U	5.5 J	20 U	20 U
Copper	2.76	1,000	150	20 U	4.2 J	20 U	20 U	6.6 J	20 U	20 U	20 U	2.7 J	20 U
Lead	2.8	15	--	20 U	6.6 J	3.6 J	2.2 J	4.5 J	20 U	20 U	2 J	20 U	2.9 J
Zinc	42.1	1,000	1,100	16.9 J	91.6	53.8	77.6	19.7 J	8.3 J	10.4 J	4.3 J	42.6 J	30.9 J
Dissolved Metals (µg/l)													
Arsenic	5.77	10	0.045	NA	20 U	NA	NA	NA	20 U	20 U	4.9 J	20 U	20 U
Copper	2.76	1,000	150	NA	20 U	NA	NA	NA	20 U	20 U	20 U	3.1 J	20 U
Lead	2.8	15	--	NA	20 U	NA	NA	NA	20 U	20 U	20 U	20 U	20 U
Zinc	42.1	1,000	1,100	NA	61.7	NA	NA	NA	8 J	8.4 J	50 U	42.5 J	27 J

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

**Bold text indicates exceedance of Adjusted Tap Water RSLs**

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

µg/l - micrograms per liter



TABLE 5-4  
IR Site 15 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	IR15-SS01	IR15-SS02	IR15-SS03		IR15-SS04	IR15-SS05	IR15-SS06	IR15-SS07	IR15-SS08	IR15-SS09	IR15-SS10
Sample ID	Background SS	(January, 2010)	Industrial Soil	Residential Soil	IR15-SS01-00-01-09C	IR15-SS02-00-01-09C	IR15-SS03-00-01-09C	IR15-SS03D-00-01-09C	IR15-SS04-00-01-09C	IR15-SS05-00-01-09C	IR15-SS06-00-01-09C	IR15-SS07-00-01-09C	IR15-SS08-00-01-09C	IR15-SS09-00-01-09C	IR15-SS10-00-01-09C
Sample Date	2X Mean		RSLs	RSLs	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name															
Volatile Organic Compounds (µg/kg)															
2-Butanone	--	16,000	20,000,000	2,800,000	22 J	9.2 R	8.5 UJ	11 R	4.4 J	NA	11 R	4.5 J	40 J	11 UJ	9.5 UJ
Acetone	--	24,000	63,000,000	6,100,000	240 J	9.2 R	14 J	11 R	52 J	NA	77 J	160 J	1,700 J	11 UJ	150 J
Chloroform	--	340	1,500	300	5.2 J	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Methyl acetate	--	--	29,000,000	7,800,000	5.8 UJ	4.6 R	4.2 UJ	5.4 R	4.5 J	NA	14 J	10 J	2,100	5.5 UJ	24 J
Toluene	--	5,500	820,000	500,000	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	10 J	5.5 UJ	4.7 UJ
Semivolatile Organic Compounds (µg/kg)															
Benzo(g,h,i)perylene	--	360,000	1,700,000	170,000	190 U	180 UJ	190 UJ	95 J	180 U	180 U	170 U	180 U	210 U	190 U	180 U
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	180 J	180 U	190 UJ	190 U	180 U	180 U	110 J	88 J	210 U	190 U	180 U
Butylbenzylphthalate	--	150,000	910,000	260,000	190 J	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Dibenz(a,h)anthracene	--	190	210	15	39 U	36 U	38 UJ	64 J	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Di-n-butylphthalate	--	19,000	6,200,000	610,000	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	120 J	150 J
Indeno(1,2,3-cd)pyrene	--	2,000	2,100	150	39 U	36 U	38 UJ	52 J	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	--	240	7,200	2,000	7.5 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	2.7	3.7
4,4'-DDE	--	--	5,100	1,400	25 J	1.8 U	0.75 J	0.88 J	1.9 U	1.8 U	0.56 J	1.1 J	2.1 J	21 J	22 J
4,4'-DDT	--	340	7,000	1,700	16 J	1.8 UJ	1 J	1.3 J	1.9 UJ	1.8 UJ	0.39 J	0.62 J	0.99 J	1.8 UJ	24 J
alpha-Chlordane	--	68	6,500	1,600	7.4 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.1 J	1 J
Aroclor-1254	--	--	740	110	360 J	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Dieldrin	--	0.81	110	30	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.7 J	0.91 J
gamma-Chlordane	--	68	6,500	1,600	8.6 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	0.58 J	0.71 J
Total Metals (mg/kg)															
Aluminum	5,487	--	99,000	7,700	4,280	5,720	12,500	11,400	3,910 J+	1,150 J+	1,250 J+	1,380 J+	4,640 J+	7,490	6,340
Antimony	0.447	--	41	3.1	0.64 J-	1.5 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 U	0.27 J	0.27 J	0.34 J	1.5 UJ	1.5 UJ
Arsenic	0.626	5.8	1.6	0.39	1.7	0.76 J	4.1	4.7	1 J	0.24 J	0.39 J	0.49 J	2.1	4.1	2.7
Barium	14.5	580	19,000	1,500	34.3	9.2	15.7	14.8	6.5	4.6	2.9 J	4.3	17.5	12.6	13.6
Beryllium	0.103	--	200	16	0.055 J	0.039 J	0.14 J	0.14 J	0.16 U	0.16 U	0.15 U	0.16 U	0.18 U	0.076 J	0.1 J
Cadmium	0.033	3	80	7	0.61	0.45 U	0.49 U	0.49 U	0.015 J	0.47 U	0.014 J	0.054 J	0.11 J	0.044 J	0.45 U
Calcium	6,360	--	--	--	36,500	1,680	12,600	29,900	94.3	157	182	366	2,230	742	555
Chromium	6.05	3.8	5.6	0.29	7.2	5.7	17.1	17.2	4	1.7	1.4 J	1.9	6.2	10.2	8.4
Cobalt	0.294	--	30	2.3	0.57	0.24 J	0.57	0.56	0.086 J	0.069 J	0.38 U	0.067 J	0.45 U	0.42	0.3 J
Copper	4.83	700	4,100	310	42.1	1.1 J	2.9	3.2	0.73 J	0.54 J	1.4 J	1.9	13.1	4.1	7.9
Iron	3,245	150	72,000	5,500	5,010	1,620	9,030	10,200	2,410	559	903	930	3,430	6,430	5,270
Lead	12.3	270	800	400	70.3	3.7	9.1	12.1	3.9	3	9.1	12.2	38.6	11	19.4
Magnesium	238	--	--	--	312	197	614	796	103	46.7	53.7	60.4	247	339	263
Manganese	13.7	65	2,300	180	22.2	5.5	9.7	14	4.6	5.2	6.2	7.6	14.3	7.9	12.5
Mercury	0.081	1	31	2.4	0.51	0.034 U	0.035 U	0.041	0.034 U	0.034 U	0.033 U	0.019 J	0.039 U	0.044	0.049
Nickel	1.21	130	2,000	160	2.7	1.3	1.8	2.1	0.55 J	0.48 J	0.49 J	0.53 J	1.6	1.7	1.6
Potassium	116	--	--	--	184	287	497	475	109	78.8 U	76.3 U	78.8 U	220	367	249
Selenium	0.563	2.1	510	39	0.49 J	1.5 U	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	1.8 U	1.5 U	1.5 U
Silver	0.14	3.4	510	39	1.6 U	1.5 U	1.6 U	1.6 U	1.6 U	0.17 J	1.5 U	1.6 U	1.8 U	1.5 U	1.5 U
Sodium	80.9	--	--	--	17.5 J	6.7 J	40.9 J	68.7 J	202 U	197 U	191 U	197 U	17.1 J	13.8 J	188 U
Vanadium	8.9	--	520	39	7.5	7.2	20.1	22.3	5.5	2.2 J	2.3 J	2.7 J	8.9	18	13.2
Zinc	10.8	1,200	31,000	2,400	170	3.8 U	10	11.9	4 U	3.9 U	6	7.5	26.2	12.5	18
Wet Chemistry															
pH	--	--	--	--	7.8	8.3	7.9	8	4.7	4.8	4.8	5.6	5.6	5.2	5.5

Notes:  
Shading indicates exceedance of two times the mean base background concentration  
Bold box indicates exceedance of NC SSLs  
Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram  
µg/kg - micrograms per kilogram



TABLE 5-5  
Site 15 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	IR15-SB01	IR15-SB02		IR15-SB03	IR15-SB04	IR15-SB05	IR15-SB06	IR15-SB07	IR15-SB08	IR15-SB09	IR15-SB10
Sample ID					IR15-SB01-4-6-09C	IR15-SB02-2-7-09C	IR15-SB02D-2-7-09C	IR15-SB03-2-7-09C	IR15-SB04-2-7-09C	IR15-SB05-2-7-09C	IR15-SB06-2-7-09C	IR15-SB07-2-4-09C	IR15-SB08-2-4-09C	IR15-SB09-2-7-09C	IR15-SB10-2-4-09C
Sample Date					07/29/09	07/26/09	07/26/09	07/29/09	07/27/09	07/27/09	07/27/09	07/27/09	07/29/09	07/29/09	07/29/09
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,2,4-Trichlorobenzene	--	2,200	28,000	6,200	1.7 U	2 UJ	2.4 UJ	1.8 U	2.4 J	1.8 UJ	3.2 R	2.5 J	1.9 J	2.4 J	1.6 U
1,3-Dichlorobenzene	--	7,600	--	--	1.7 U	2 UJ	2.4 UJ	1.8 U	1.4 J	1.8 UJ	3.2 R	1.6 J	1.6 U	1.3 J	1.6 U
1,4-Dichlorobenzene	--	70	12,000	2,400	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	1.6 J	1.6 U	1.4 J	1.6 U
2-Butanone	--	16,000	20,000,000	2,800,000	3.4 U	4 UJ	4.8 UJ	3.6 U	6.6 J	3.7 UJ	3.2 R	21 J	3.1 U	15 J	3.2 U
2-Hexanone	--	1,200	140,000	21,000	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.1 J	3.1 U	0.6 J	3.2 U
4-Methyl-2-pentanone	--	--	3,400,000	530,000	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 U	1.7 J	3.2 U
Acetone	--	24,000	63,000,000	6,100,000	3.4 U	42 J	39 J	6.4 J	41 J	19 J	60 J	120 J	18 J	180 J	4.6
Benzene	--	7.3	5,400	1,100	1.7 U	2 UJ	2.4 UJ	1.8 U	0.97 J	1.8 UJ	1.6 R	2.1 UJ	1.6 U	0.42 J	1.6 U
Carbon disulfide	--	3,800	370,000	82,000	1.7 U	2 UJ	1.4 J	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Chlorobenzene	--	450	140,000	29,000	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	2.6 J	1.6 U
Methyl acetate	--	--	29,000,000	7,800,000	1.7 U	1.9 J	3.5 J	1.8 U	1.9 UJ	7.8 J	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Methylene chloride	--	23	53,000	11,000	3.4 UJ	2.2 J	3.1 J	3.6 UJ	2.9 J	8.9 J	3.2 R	3.3 J	3.1 U	3.9 R	3.2 UJ
Styrene	--	920	870,000	630,000	1.7 U	2 UJ	2.4 UJ	1.8 U	3.9 UJ	1.8 UJ	3.2 R	2.9 J	3.1 U	2.6 J	1.6 U
Tetrachloroethene	--	5	2,600	550	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.5 J	1.6 U
Toluene	--	5,500	820,000	500,000	1.7 U	2 UJ	2.4 UJ	1.8 U	2.8 J	1.8 UJ	1.6 R	2.9 J	1.6 U	0.42 J	1.6 U
Semivolatile Organic Compounds (µg/kg)															
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	37 J	320 U	330 U	31 J	360 U	330 U	180 U	210 U	190 U	200 U	32 J
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	--	240	7,200	2,000	1.9 U	0.61 J	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	0.58 J	0.61 J	13	46
4,4'-DDE	--	--	5,100	1,400	1.9 U	9.7 J	0.54 J	1.9 U	1.6 J	0.56 J	1.8 U	0.68 J	0.92 J	6.8	95
4,4'-DDT	--	340	7,000	1,700	1.9 U	3.9 J	1.9 UJ	1.9 U	0.92 J	1 J	1.8 U	2.1 U	1.9 U	25	180
alpha-Chlordane	--	68	6,500	1,600	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	3.7 J	9.9 J
Dieldrin	--	0.81	110	30	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	<b>2.3</b>	1.8 U	2.1 U	1.9 U	2 U	1.8 U
gamma-Chlordane	--	68	6,500	1,600	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	3.2	7.4
Total Metals (mg/kg)															
Aluminum	10,369	--	99,000	7,700	3,380	6,070 J	5,570 J	3,310	4,940	4,190 J	1,590	2,650	455	5,090	3,550
Antimony	0.36	--	41	3.1	0.82 J-	1.6 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.6 UJ	1.5 UJ	1.7 UJ	1.6 UJ	8.6 UJ	0.21 J-
Arsenic	2.12	5.8	1.6	0.39	<b>1.8</b>	<b>1.6</b>	<b>1.4 J</b>	<b>1.2 J</b>	<b>1.9</b>	<b>1.8</b>	0.38 J	<b>0.63 J</b>	1.6 U	<b>16.6</b>	<b>1.4 J</b>
Barium	16.6	580	19,000	1,500	32.3	13.6	12	5.4	14.8 J	6.8	3.6 J	8.8 J	4.1 U	21.5 U	8.5
Beryllium	0.165	--	200	16	0.042 J	0.16 U	0.16 U	0.04 J	0.18 U	0.16 U	0.15 U	0.17 U	0.16 U	0.071 J	0.056 J
Cadmium	0.023	3	80	7	0.53	0.47 U	0.47 U	0.47 U	0.54 U	0.49 U	0.46 U	0.52 U	0.49 U	0.82 J	0.019 J
Calcium	441	--	--	--	20,000	518	470	156	670	425	76.9 U	283	82.1 U	2,630	137
Chromium	14.5	3.8	5.6	0.29	<b>6.9 J</b>	<b>6.3</b>	<b>5.5</b>	<b>4.7 J</b>	<b>7.4</b>	<b>6.1</b>	<b>6.3</b>	<b>3.1</b>	<b>1.1 J</b>	<b>52.4 J</b>	<b>5.7 J</b>
Cobalt	0.822	--	30	2.3	0.73	0.32 J	0.22 J	0.16 J	0.39 J	0.22 J	0.066 J	0.099 J	0.41 U	<b>9.3</b>	0.14 J
Copper	2.56	700	4,100	310	27.5	5.9	4.6	0.71 J	31.7	1.6 U	0.89 J	2.1	0.27 J	10.6	2.6
Iron	5,439	150	72,000	5,500	<b>5,830</b>	4,050	2,640	2,540	3,470	2,260	718	1,290	153 J+	<b>179,000 J±</b>	3,020
Lead	8.49	270	800	400	<b>483</b>	28.4	21.6	2.9	53	4.6	2.7	5.7	1.3 J	111	5.8
Magnesium	363	--	--	--	219	174	178	130	206	180	58	89.6	17.2 J	200	105
Manganese	9.25	65	2,300	180	69.6	9.2	9.2	6.8	21.9 J+	5.9	5.6 J+	8 J+	1.5	<b>626</b>	6.9
Mercury	0.071	1	31	2.4	0.14	0.036	0.013 J	0.033 U	0.036 J	0.035 U	0.0027 J	0.032 J	0.033 U	0.037 U	0.045
Nickel	2.27	130	2,000	160	3.9	1.7	1.5	0.79 U	1.5 J	0.88	0.74 J	0.74 J	0.82 U	24.4	1
Potassium	361	--	--	--	143	121	137	144	199	166	54.4 J	64.3 J	18.2 J	236 J	102
Sodium	68.3	--	--	--	202 U	8.8 J	7.7 J	5.6 J	15 J	7.2 J	4.3 J	8.2 J	205 U	1,080 U	194 U
Thallium	0.38	--	6.6	0.51	2.4 U	2.3 U	2.4 U	2.4 U	2.7 U	2.5 U	2.3 U	2.6 U	2.5 U	<b>1.9 J</b>	2.3 U
Vanadium	17.2	--	520	39	7	10.4 J+	7.3 J+	6	8.9 J	8.8 J+	2.3 J	3.4 J	4.1 U	21.5 U	7.1
Zinc	6.59	1,200	31,000	2,400	345	19.5	17.1	3.9 U	34.3	4.1 U	1.5 J	4.1 J	4.1 U	99	8 U
Wet Chemistry															
pH (ph)	--	--	--	--	7.5	6.9	7.3	5.1	7.4	5.9	5.4	6	6.8	7.5	5

Notes:  
Shading indicates exceedance of two times the mean base background concentration  
Bold box indicates exceedance of NCSSLs  
Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram  
ph - pH units  
µg/kg - micrograms per kilogram



TABLE 5-6

IR Site 15 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background GW 2X Mean	NCGWQS (January, 2010)	Adjusted Tap Water RSLs	IR15-TW01	IR15-TW02	IR15-TW03		IR15-TW04	IR15-TW05
Sample ID				IR15-TW01-09C	IR15-TW02-09C	IR15-TW03-09C	IR15-TW03D-09C	IR15-TW04-09C	IR15-TW05-09C
Sample Date				07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09
<b>Chemical Name</b>									
<b>Volatile Organic Compounds (µg/l)</b>									
Isopropylbenzene	--	70	68	1 U	1 U	1 UJ	4.9 J	1 U	1 R
Styrene	--	70	160	1 U	1 U	1 UJ	5.9 J	1 U	1 R
<b>Semivolatile Organic Compounds (µg/l)</b>									
No Detections				NA	NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (µg/l)</b>									
No Detections				NA	NA	NA	NA	NA	NA
<b>Total Metals (µg/l)</b>									
Aluminum	1,886	--	3,700	45.8 J	148 J	612 J	1,000 U	307 J	3,360
Arsenic	5.77	10	0.045	20 U	20 U	20 U	20 U	3.2 J	20 U
Barium	86.2	700	730	28 J	24.3 J	92.1	95	24.1 J	19.2 J
Beryllium	0.308	4	7.3	2 U	2 U	0.17 J	0.18 J	2 U	2 U
Calcium	69,078	--	--	27,500	4,110	3,580	3,540	45,500	42,500
Chromium	3.13	10	0.043	20 U	20 U	20 U	1.7 J	20 U	5 J
Cobalt	3.4	--	1.1	3.9 J	0.63 J	1 J	2.6 J	0.66 J	5 U
Copper	2.76	1,000	150	20 U	2.8 J	20 U	2.9 J	20 U	3.8 J
Iron	5,999	300	2,600	25,800	2,910	6,450	6,440	10,600	1,040
Magnesium	6,363	--	--	1,410	393	4,520	4,620	2,940	1,040
Manganese	214	50	88	439	49.6	87	89.6	149	5.2
Nickel	7.97	100	73	30	21.2	10.1	12.1	10 U	2.3 J
Potassium	3,277	--	--	1,330	2,540	1,480	1,550	808 J	624 J
Sodium	22,508	--	--	1,590 J	5,120	7,670	8,000	2,910	4,510
Thallium	3.78	2	0.24	30 U	30 U	30 U	30 U	3.2 J	30 U
Zinc	42.1	1,000	1,100	5.3 J	5.5 J	10.9 J	7.8 J	9.2 J	7.1 J
<b>Dissolved Metals (µg/l)</b>									
Aluminum	1,886	--	3,700	1,000 U	40 J	516 J	629 J	1,000 U	1,000 U
Barium	86.2	700	730	25.6 J	21.8 J	94	96.8	23.2 J	20 U
Beryllium	0.308	4	7.3	2 U	0.089 J	0.21 J	0.2 J	2 U	2 U
Calcium	69,078	--	--	25,000	3,980	3,550	3,710	44,100	42,900
Cobalt	3.4	--	1.1	3.1 J	0.54 J	1.1 J	1.1 J	0.66 J	5 U
Copper	2.76	1,000	150	2.7 J	4.6 J	2.7 J	20 U	20 U	20 U
Iron	5,999	300	2,600	20,500	2,570	6,620	6,720	7,240	102 J
Magnesium	6,363	--	--	1,350	370	4,580	4,740	2,840	912
Manganese	214	50	88	236	45.7	90.2	88.8	165	2.8 J
Nickel	7.97	100	73	25	23	10.2	10.4	10 U	10 U
Potassium	3,277	--	--	1,110	2,460	1,560	1,600	780 J	472 J
Sodium	22,508	--	--	1,580 J	5,010	7,910	8,120	2,900	4,290
Zinc	42.1	1,000	1,100	50 U	9.9 J	7.6 J	12.1 J	50 U	50 U
<b>Wet Chemistry</b>									
pH	--	8.5	--	NA	NA	NA	NA	NA	6.4

## Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

Bold text indicates exceedance of Adjusted Tap Water RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

µg/l - micrograms per liter



TABLE 5-7

IR Site 17 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Rept  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLS (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	IR17-SS01		IR17-SS02	IR17-SS03	IR17-SS04	IR17-SS05
Sample ID					IR17-SS01-00-01-09C 07/10/09	IR17-SS01D-00-01-09C 07/10/09	IR17-SS02-00-01-09C 07/10/09	IR17-SS03-00-01-09C 07/10/09	IR17-SS04-00-01-09C 07/10/09	IR17-SS05-00-01-09C 07/10/09
Sample Date										
Chemical Name										
Volatile Organic Compounds (µg/kg)										
2-Butanone	--	16,000	20,000,000	2,800,000	14 J	4.9 J	5.1 J	11 UJ	23 J	2.8 J
Acetone	--	24,000	63,000,000	6,100,000	680 J	200 J	70 J	11 UJ	900 J	72 J
Chloroform	--	340	1,500	300	6.5 UJ	3 UJ	13 J	5.4 UJ	5.2 R	4.8 UJ
Chloromethane	--	15	50,000	12,000	6.5 J	2.8 J	9.2 UJ	11 UJ	10 R	9.7 UJ
Methyl acetate	--	--	29,000,000	7,800,000	6.5 UJ	3 UJ	4.3 J	3.6 J	70 J	7 J
Semivolatile Organic Compounds (µg/kg)										
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	96 J	240 U	180 U	180 U	180 U	180 U
Di-n-butylphthalate	--	19,000	6,200,000	610,000	93 J	240 U	180 U	180 U	180 U	180 U
Pesticide/Polychlorinated Biphenyls (µg/kg)										
4,4'-DDE	--	--	5,100	1,400	0.63 J	0.6 J	1.1 J	1.8 UJ	0.83 J	2.2 J
4,4'-DDT	--	340	7,000	1,700	2.5 UJ	2.4 UJ	1.9 J	1.8 UJ	1 J	0.9 J
Total Metals (mg/kg)										
Aluminum	5,487	--	99,000	7,700	7,580 J+	7,110 J+	7,320	5,150	5,810	5,520
Arsenic	0.626	5.8	1.6	0.39	4.9	3.3	1.3 J	1.9	1.8	1.1 J
Barium	14.5	580	19,000	1,500	16.1	19.2	21.3	12.7	14.8	14.9
Beryllium	0.103	--	200	16	0.21 U	0.2 U	0.16	0.15 U	0.14 J	0.14 J
Cadmium	0.033	3	80	7	0.64 U	0.61 U	0.02 J	0.45 U	0.44 U	0.46 U
Calcium	6,360	--	--	--	356	372	91.5	210	92.5	181
Chromium	6.05	3.8	5.6	0.29	8.3	7.5	3.8	3.7	3.3	2.7
Cobalt	0.294	--	30	2.3	0.54 U	0.51 U	0.29 J	0.21 J	0.33 J	0.31 J
Copper	4.83	700	4,100	310	1 J	0.95 J	0.92 J	0.7 J	0.81 J	0.93 J
Iron	3,245	150	72,000	5,500	7,640	5,230	2,190	1,800	1,670	1,880
Lead	12.3	270	800	400	17.1	13.9	7.5	9.3	8.7	9.3
Magnesium	238	--	--	--	667	646	221	178	186	132
Manganese	13.7	65	2,300	180	9.1	8.2	9.3	8.7	10.8	5.9
Mercury	0.081	1	31	2.4	0.052	0.045 U	0.033 U	0.042	0.033 U	0.033 U
Nickel	1.21	130	2,000	160	1.5	1.2	2	1.4	1.5	1.4
Potassium	116	--	--	--	495	461	134	119	116	113
Selenium	0.563	2.1	510	39	0.69 J	0.57 J	1.5 U	1.5 U	1.5 U	1.5 U
Silver	0.14	3.4	510	39	0.4 J	0.16 J	1.5 U	1.5 U	1.5 U	1.5 U
Sodium	80.9	--	--	--	1,840	1,870	30.8 J	188 U	13.5 J	13.1 J
Vanadium	8.9	--	520	39	20.8	15.9	6.8	6.2	6.2	5.8
Zinc	10.8	1,200	31,000	2,400	5.4 U	5.1 U	5.2	4.3	4.3	5.2
Wet Chemistry										
pH	--	--	--	--	4.2	4.2	4.7	4.6	4.9	4.3

## Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCSSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

J+ - Analyte present, value may be biased high, actual value may be lower

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

µg/kg - micrograms per kilogram



TABLE 5-8

IR Site 17 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SB 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	IR17-SB01 IR17-SB01-2-4-09C 07/27/09	IR17-SB02 IR17-SB02-2-7-09C 07/28/09	IR17-SB03 IR17-SB03-2-7-09C 07/28/09	IR17-SB04 IR17-SB04-2-7-09C 07/28/09	IR17-SB05 IR17-SB05-2-7-09C 07/28/09
Sample ID									
Sample Date									
Chemical Name									
<b>Volatile Organic Compounds (µg/kg)</b>									
1,2,4-Trichlorobenzene	--	2,200	28,000	6,200	1.1 J	1.4 U	2 UJ	1.8 R	1.8 UJ
1,2-Dibromo-3-chloropropane	--	0.25	69	5.4	1.6 J	1.4 U	2 UJ	1.8 R	1.8 UJ
2-Butanone	--	16,000	20,000,000	2,800,000	1.4 J	2.9 U	2.6 J	1.3 J	3.5 UJ
Acetone	--	24,000	63,000,000	6,100,000	70 J	2.9 U	99 J	41 J	3.5 UJ
Chloroform	--	340	1,500	300	4.9 J	2.3	2 UJ	1.8 UJ	1.8 UJ
Methyl acetate	--	--	29,000,000	7,800,000	1.3 J	1.4 U	96 J	13 J	1.3 J
Methylene chloride	--	23	53,000	11,000	2.2 UJ	1.4 U	1.5 J	1.8 UJ	1.8 UJ
<b>Semivolatile Organic Compounds (µg/kg)</b>									
No Detections					NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (µg/kg)</b>									
4,4'-DDE	--	--	5,100	1,400	1.7 U	1.7 U	1.7 U	1.7 U	0.41 J
<b>Total Metals (mg/kg)</b>									
Aluminum	10,369	--	99,000	7,700	17,400	4,520	20,000	17,700	5,270
Antimony	0.36	--	41	3.1	0.93 J	1.7 U	1.8 U	1.8 U	1.6 U
Arsenic	2.12	5.8	1.6	0.39	7.2	1.3 J	13	14.6	0.95 J
Barium	16.6	580	19,000	1,500	18.9	9.7	21.8	20	6.6
Beryllium	0.165	--	200	16	0.21	0.057 J	0.31	0.28	0.055 J
Calcium	441	--	--	--	90 U	84.6 U	89.1 U	92 U	227
Chromium	14.5	3.8	5.6	0.29	27.4	4.7	35.8	34.1	5.6
Cobalt	0.822	--	30	2.3	0.59	0.28 J	1.1	1	0.26 J
Copper	2.56	700	4,100	310	3.5	0.66 J	5	4.2	0.86 J
Iron	5,439	150	72,000	5,500	16,400	2,240	19,600	28,400	2,500
Lead	8.49	270	800	400	10.7	5.2	15.4	15.9	3.3
Magnesium	363	--	--	--	791	179	1,020	836	184
Manganese	9.25	65	2,300	180	10.8	8.7	12.1	13.3	5.4
Mercury	0.071	1	31	2.4	0.039 U	0.036 U	0.04 U	0.041 U	0.033 U
Nickel	2.27	130	2,000	160	2.1	1.3	2.7	2.5	1.2
Potassium	361	--	--	--	943	145	1,070	833	155
Selenium	0.505	2.1	510	39	1.8 U	1.7 U	1.2 J	1.4 J	1.6 U
Sodium	68.3	--	--	--	230	22.6 J	106 J	81.9 J	5.3 J
Vanadium	17.2	--	520	39	37.6	7	49.4	70.4	7.4
Zinc	6.59	1,200	31,000	2,400	7.5	3.1 J	8.9	8.9	2.4 J
<b>Wet Chemistry</b>									
pH	--	--	--	--	3.8	4.6	4.4	4.3	4.7

## Notes:

Shading indicates exceedance of two times the mean base background concentration for

Bold box indicates exceedance of NCSSLs

Bold text indicates exceedance of Adjusted Industrial Soil RSLs

Underline indicates exceedance of Adjusted Residential Soil RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - milligrams per kilogram

µg/kg - micrograms per kilogram



TABLE 5-9

IR Site 17 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCGWQS (January,	Adjusted Tap Water	IR17-TW01	IR17-TW02	
Sample ID	Background GW 2X	2010)	RSLs	IR17-TW01-09C	IR17-TW02-09C	IR17-TW02D-09C
Sample Date	Mean			07/29/09	07/29/09	07/29/09
<b>Chemical Name</b>						
<b>Volatile Organic Compounds (µg/l)</b>						
Chloroform	--	70	0.19	4.4	1 U	1 U
<b>Semivolatile Organic Compounds (µg/l)</b>						
Caprolactam	--	4,000	1,800	4.5 J	10 U	10 U
<b>Pesticide/Polychlorinated Biphenyls (µg/l)</b>						
No Detections				NA	NA	NA
<b>Total Metals (µg/l)</b>						
Aluminum	1,886	--	3,700	1,680	621 J	1,260
Barium	86.2	700	730	474	8 J	9.2 J
Beryllium	0.308	4	7.3	2 U	0.12 J	0.16 J
Calcium	69,078	--	--	111,000	911 J	893 J
Chromium	3.13	10	0.043	1.8 J	20 U	20 U
Iron	5,999	300	2,600	2,590	814	1,170
Lead	2.8	15	--	3.2 J	20 U	3.2 J
Magnesium	6,363	--	--	57,300	466	537
Manganese	214	50	88	57.5	16.9	17.7
Mercury	0.1	1	1.1	0.25	0.2 U	0.2 U
Nickel	7.97	100	73	13.8	10 U	10 U
Potassium	3,277	--	--	8,250	1,010	1,070
Selenium	3.14	20	18	20 U	3.9 J	4.2 J
Sodium	22,508	--	--	499,000	7,220	7,470
Zinc	42.1	1,000	1,100	10.2 J	5.7 J	4.9 J
<b>Dissolved Metals (µg/l)</b>						
Aluminum	1,886	--	3,700	567 J	1,000 U	1,000 U
Barium	86.2	700	730	498	5.1 J	4.5 J
Beryllium	0.308	4	7.3	2 U	0.1 J	2 U
Calcium	69,078	--	--	110,000	612 J	609 J
Copper	2.76	1,000	150	3.8 J	20 U	20 U
Iron	5,999	300	2,600	2,760	309	296
Lead	2.8	15	--	2.6 J	20 U	20 U
Magnesium	6,363	--	--	59,200	263	266
Manganese	214	50	88	64.6	13	11
Nickel	7.97	100	73	15.9	10 U	10 U
Potassium	3,277	--	--	8,580	1,060	1,040
Selenium	3.14	20	18	20 U	20 U	4.2 J
Sodium	22,508	--	--	510,000	7,650	7,810
Zinc	42.1	1,000	1,100	14.7 J	7.9 J	5.2 J

**Notes:**

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

Bold text indicates exceedance of Adjusted Tap Water RSLs

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

µg/l - micrograms per liter



TABLE 5-10  
IR Site 85 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs	IR85-SS06	IR85-SS07	IR85-SS08	IR85-SS09		IR85-SS10	IR85-SS11	IR85-SS12	IR85-SS13	IR85-SS14	
Sample ID					IR85-SS06-00-01-09C	IR85-SS07-00-01-09C	IR85-SS08-00-01-09C	IR85-SS09-00-01-09C	IR85-SS09D-00-01-09C	IR85-SS10-00-01-09C	IR85-SS11-00-01-09C	IR85-SS12-00-01-09C	IR85-SS13-00-01-09C	IR85-SS14-00-01-09C	IR85-SS14D-00-01-09C
Sample Date					07/09/09	07/09/09	07/09/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name															
Volatile Organic Compounds (µg/kg)															
2-Butanone	--	16,000	20,000,000	2,800,000	7.8 J	9.7 UJ	9.5 UJ	12 UJ	6.6 J	4.9 R	12 R	7.3 J	6.9 J	14 J	27 J
Acetone	--	24,000	63,000,000	6,100,000	250 J	85 J	65 J	1,300 J	280 J	75 R	320 J	130 J	110 J	270 J	420 J
Methyl acetate	--	--	29,000,000	7,800,000	12 J	3.8 J	8 J	84 J	18 J	15 R	6.2 R	20 J	12 J	12 J	26 J
Methylene chloride	--	23	53,000	11,000	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ
Semivolatile Organic Compounds (µg/kg)															
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	140 J	180 U	190 U	58 J	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	--	240	7,200	2,000	1.9 U	1.8 U	0.93 J	1.8 U	1.8 U	0.39 J	1.8 U	1.4 J	1.9 U	1.9 U	1.9 U
4,4'-DDE	--	--	5,100	1,400	1.9 U	0.99 J	2.7	2.4 J	2.6 J	4.5	0.64 J	3 J	0.71 J	3.1 J	3 J
4,4'-DDT	--	340	7,000	1,700	1.9 UJ	0.68 J	1.2 J	2.4 J	0.83 J	3 J	1.8 UJ	3.6 J	0.86 J	1.4 J	1.4 J
Aroclor-1254	--	--	740	110	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U
Dieldrin	--	0.81	110	30	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ
gamma-Chlordane	--	68	6,500	1,600	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ
Total Metals (mg/kg)															
Aluminum	5,487	--	99,000	7,700	6,090 J+	3,780 J+	3,480 J+	3,370 J+	3,250 J+	5,180	5,690	3,960 J+	3,390 J+	7,220 J+	7,300 J+
Antimony	0.447	--	41	3.1	1.6 U	1.6 U	1.6 U	1.6 UJ	1.5 U	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ
Arsenic	0.626	5.8	1.6	0.39	0.83 J	0.78 J	0.85 J	1.1 J	0.93 J	1.1 J	0.91 J	0.83 J	0.57 J	1.2 J	1.2 J
Barium	14.5	580	19,000	1,500	10.8	8.6	9.4	10	9	12.6	10.6	9.9	5.9	13.4	13.3
Beryllium	0.103	--	200	16	0.16 U	0.16 U	0.16 U	0.055 J	0.15 U	0.034 J	0.036 J	0.047 J	0.025 J	0.031 J	0.042 J
Cadmium	0.033	3	80	7	0.49 U	0.47 U	0.49 U	0.47 U	0.46 U	0.45 U	0.46 U	0.48 U	0.48 U	0.48 U	0.49 U
Calcium	6,360	--	--	--	82.1 U	78.7 U	167	316	282	266	76.4 U	118	97.5	37.2 J	40.5 J
Chromium	6.05	3.8	5.6	0.29	3.5	2.8	3.3	2.7	2.7	4.1	3.2	3.6	3	4.5	4.5
Cobalt	0.294	--	30	2.3	0.41 U	0.39 U	0.12 J	0.11 J	0.11 J	0.21 J	0.11 J	0.13 J	0.11 J	0.17 J	0.19 J
Copper	4.83	700	4,100	310	2.4	1.3 J	4.3	0.69 J	0.76 J	7	1.4 J	4.7	2.8	1.5 J	1.4 J
Iron	3,245	150	72,000	5,500	2,310	1,690	1,820	2,040	2,000	2,530	1,830	2,010	1,870	3,730	3,700
Lead	12.3	270	800	400	4.8	7.2	7.8	7.8	6.5	17.5	6.2	17.4	7.2	7.5	7.3
Magnesium	238	--	--	--	173	108	110	95.8	95.2	173	146	112	98.1	172	178
Manganese	13.7	65	2,300	180	11.6	9.6	22.6	6.7	7.7	43.7	5.9	20.4	12.6	9.1	9.9
Mercury	0.081	1	31	2.4	0.044	0.033 U	0.038	0.032 U	0.037	0.31	0.034 U	0.055	0.039	0.059	0.06
Nickel	1.21	130	2,000	160	1.2	0.91	1.1	0.93	0.81	1.3	2.5	1.3	1.4	1.3	1.2
Potassium	116	--	--	--	136	73.1 J	81.7 U	78.3 U	72.1 J	115	96.9	79.5 U	79.3 U	109	117
Selenium	0.563	2.1	510	39	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	0.45 J	1.6 U
Silver	0.14	3.4	510	39	1.6 U	0.083 J	1.6 U	1.6 U	1.5 U	1.5 U	1.5 U	0.15 J	0.21 J	1.6 U	1.6 U
Sodium	80.9	--	--	--	3.2 J	3.7 J	204 U	5.7 J	7.5 J	3.4 J	4.3 J	3.9 J	198 U	6.8 J	6.4 J
Thallium	0.36	--	6.6	0.51	2.5 U	2.4 U	2.4 U	2.3 U	2.3 U	2.3 U	2.3 U	2.4 U	2.4 U	2.4 U	2.5 U
Vanadium	8.9	--	520	39	6.6	5.7	5.5	6 J	5.8	7.7	7.1	5.9 J	5.3 J	9.8 J	10 J
Zinc	10.8	1,200	31,000	2,400	33.4	5.2	31.4	3.9 U	3.9 U	252	4.2	30.2	22.9	4 U	4.1 U
Wet Chemistry															
pH	--	--	--	--	4.8	4.5	5.6	4.4	4.5	5.6	4.3	4.8	4.8	4.4	4.4

Notes:  
Shading indicates exceedance of two times the mean base background concentration  
Bold box indicates exceedance of NCSSLs  
Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
µg/kg - micrograms per kilogram



TABLE 5-10  
IR Site 85 Surface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	IR85-SS15	IR85-SS16	IR85-SS17	IR85-SS18
Sample ID	Background SS	(January, 2010)	Industrial	Residential	IR85-SS15-00-01-09C	IR85-SS16-00-01-09C	IR85-SS17-00-01-09C	IR85-SS18-00-01-09C
Sample Date	2X Mean		Soil RSLs	Soil RSLs	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name								
Volatile Organic Compounds (µg/kg)								
2-Butanone	--	16,000	20,000,000	2,800,000	8.6 UJ	13 UJ	19 UJ	11 R
Acetone	--	24,000	63,000,000	6,100,000	38 J	40 J	360 J	72 J
Methyl acetate	--	--	29,000,000	7,800,000	5.7 J	11 J	200 J	5.4 R
Methylene chloride	--	23	53,000	11,000	8.6 UJ	13 UJ	14 J	11 R
Semivolatile Organic Compounds (µg/kg)								
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	29 J	190 U	230 U	220 U
Pesticide/Polychlorinated Biphenyls (µg/kg)								
4,4'-DDD	--	240	7,200	2,000	1.9 U	0.97 J	2.3 U	3.1 J
4,4'-DDE	--	--	5,100	1,400	2.4 J	4.5 J	1.5 J	29 J
4,4'-DDT	--	340	7,000	1,700	3 J	1.9 J	4 J	25 J
Aroclor-1254	--	--	740	110	40 J	17 U	50	22 U
Dieldrin	--	0.81	110	30	1.9 UJ	1.9 UJ	1.9 J	2.2 UJ
gamma-Chlordane	--	68	6,500	1,600	1.9 UJ	1.9 UJ	0.88 J	2.7 J
Total Metals (mg/kg)								
Aluminum	5,487	--	99,000	7,700	4,960 J+	4,100 J+	2,980 J+	4,330
Antimony	0.447	--	41	3.1	1.7 UJ	1.6 UJ	38.5 UJ	5.9 J-
Arsenic	0.626	5.8	1.6	0.39	1.5 J	1.9	9.9 J	2.3 J
Barium	14.5	580	19,000	1,500	14.2	15.7	31 J	24 U
Beryllium	0.103	--	200	16	0.049 J	0.042 J	3.9 U	0.096 J
Cadmium	0.033	3	80	7	0.59	0.49 U	2.9 J	3.5
Calcium	6,360	--	--	--	289	468	1,930 U	481 U
Chromium	6.05	3.8	5.6	0.29	4.5	5.1	38.5 U	8.5 J
Cobalt	0.294	--	30	2.3	0.3 J	0.31 J	2.4 J	0.66 J
Copper	4.83	700	4,100	310	26.5	13.2	79.5	214
Iron	3,245	150	72,000	5,500	3,170	3,990	4,820	11,500
Lead	12.3	270	800	400	42.6	35.2	165	614
Magnesium	238	--	--	--	165	143	80.5 J	143
Manganese	13.7	65	2,300	180	294	417	10,700	1,120
Mercury	0.081	1	31	2.4	1.1	0.27	5	8.8
Nickel	1.21	130	2,000	160	2.2	1.8	8.7 J	2.8 J
Potassium	116	--	--	--	126	109	1,930 U	117 J
Selenium	0.563	2.1	510	39	1.7 U	1.6 U	38.5 U	9.6 U
Silver	0.14	3.4	510	39	0.11 J	0.29 J	38.5 U	9.6 U
Sodium	80.9	--	--	--	207 U	206 U	4,820 U	1,200 U
Thallium	0.36	--	6.6	0.51	2.5 U	0.44 J	18.7 J	14.4 U
Vanadium	8.9	--	520	39	7.8 J	7.6 J	96.3 U	9 J
Zinc	10.8	1,200	31,000	2,400	758	406	5,600	2,100
Wet Chemistry								
pH	--	--	--	--	5.9	6.4	6.4	5.4

Notes:  
Shading indicates exceedance of two times the mean base background concentration  
Bold box indicates exceedance of NCSSLs  
Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
µg/kg - micrograms per kilogram



TABLE 5-11  
IR Site 85 Subsurface Soil Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCSSLs	Adjusted	Adjusted	IR85-SB06	IR85-SB07	IR85-SB08	IR85-SB09	IR85-SB10	IR85-SB11	IR85-SB12	IR85-SB13	IR85-SB14	IR85-SB17	
Sample ID	Background SB 2X	(January, 2010)	Industrial	Residential	IR85-SB06-2-7-09C	IR85-SB07-2-4-09C	IR85-SB08-2-7-09C	IR85-SB09-2-7-09C	IR85-SB10-4-7-09C	IR85-SB11-2-7-09C	IR85-SB12-2-7-09C	IR85-SB13-2-7-09C	IR85-SB14-2-7-09C	IR85-SB17-6-7-09C	IR85-SB17D-6-7-09C
Sample Date	Mean		Soil RSLs	Soil RSLs	07/29/09	07/28/09	07/28/09	07/27/09	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,2,4-Trichlorobenzene	--	2,200	28,000	6,200	2.1 J	1.4 R	2.6 J	1.9 UJ	2 J	2.7 J	1.7 U	1.6 UJ	2 J	1.8 UJ	5.9 R
1,2-Dibromo-3-chloropropane	--	0.25	69	5.4	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	2.4 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,3-Dichlorobenzene	--	7,600	--	--	1.2 J	1.4 R	1.4 J	1.9 UJ	1.6 UJ	1.4 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
2-Butanone	--	16,000	20,000,000	2,800,000	1.5 J	2.8 J	2.3 J	3.8 UJ	2.6 J	2.6 J	3.5 U	4.1 J	3.2 J	1.6 J	12 R
4-Methyl-2-pentanone	--	--	3,400,000	530,000	3.3 U	2.9 R	4.1 UJ	3.8 UJ	3.1 U	1.5 J	3.5 U	3.3 UJ	3.3 U	3.6 UJ	12 R
Acetone	--	24,000	63,000,000	6,100,000	30 J	76 J	39 J	3.8 UJ	69 J	33 J	3.5 U	100 J	75 J	90 J	20 J
Chloroform	--	340	1,500	300	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Isopropylbenzene	--	1,300	270,000	210,000	2.2 J	1.4 R	2.7 J	1.9 UJ	2 J	2.6 J	1.7 U	2.1 J	1.7 U	1.8 UJ	5.9 R
Methyl acetate	--	--	29,000,000	7,800,000	1.6 U	20 J	6.8 J	1.9 UJ	1.6 U	1.3 J	3.4	1.2 J	1.7 U	3 J	5.9 R
Methylene chloride	--	23	53,000	11,000	1.7 J	1.9 J	2.3 J	1.4 J	3.1 U	0.88 J	1.7 J	1.4 J	3.3 U	0.62 J	12 R
Styrene	--	920	870,000	630,000	2.2 J	1.4 R	2.8 J	1.9 UJ	2.1 J	2.7 J	1.7 U	2.3 J	3.3 U	2.5 J	5.9 R
Tetrachloroethene	--	5	2,600	550	1.3 J	1.4 R	1.6 J	1.9 UJ	1.6 U	1.6 J	1.7 U	1.3 J	1.7 U	1.8 UJ	5.9 R
Toluene	--	5,500	820,000	500,000	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	0.64 J	5.9 R
Semivolatile Organic Compounds (µg/kg)															
bis(2-Ethylhexyl)phthalate	--	7,200	120,000	35,000	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	58 J	190 U	200 U
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	--	240	7,200	2,000	1.8 U	1.3 J	1.8 U	1.9	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
4,4'-DDE	--	--	5,100	1,400	2	31	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
4,4'-DDT	--	340	7,000	1,700	1.3 J	10	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
delta-BHC	--	1.2	960	270	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.1 J	1.9 U	1.9 U	2 U
gamma-Chlordane	--	68	6,500	1,600	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 J	1.9 U	1.9 U	2 U
Total Metals (mg/kg)															
Aluminum	10,369	--	99,000	7,700	3,830	6,420	3,750	12,000	4,090	6,230	5,180	6,180	6,260	2,560	4,610
Arsenic	2.12	5.8	1.6	0.39	1 J	2.3	0.92 J	1.7	0.68 J	1.2 J	1.2 J	1.1 J	1.4 J	0.67 J	1.7 J
Barium	16.6	580	19,000	1,500	5.8	11.2	6.6	16.2	4.9	8.9	7.4	9	7.9	4 U	6.1
Beryllium	0.165	--	200	16	0.16 U	0.16 U	0.024 J	0.072 J	0.16 U	0.16 U	0.037 J	0.16 U	0.033 J	0.16 U	0.17 U
Calcium	441	--	--	--	81.2 U	79.1 U	79 U	84.8	80.1 U	80.8 U	79 U	78.2 U	16.6 J	80 U	83 U
Chromium	14.5	3.8	5.6	0.29	4.5	7.5	4.3	12.5	4.3	6.1	5.8	5.7	6.3 J	3.7	6.2
Cobalt	0.822	--	30	2.3	0.41 U	0.3 J	0.39 U	0.72	0.21 J	0.4 U	0.21 J	0.39 U	0.4 U	0.4 U	0.42 U
Copper	2.56	700	4,100	310	1.3 J	0.99 J	0.89 J	1.6	0.54 J	0.82 J	0.95 J	1 J	0.8 J	0.8 J	1.7
Iron	5,439	150	72,000	5,500	2,640	4,620	2,010	5,040	1,670	3,790	3,310	3,440	4,050 J+	1,750	2,940
Lead	8.49	270	800	400	5.2	4.8	3.3	7.7	2.8	3.6	4.3	4.5	3.7	3	4.9
Magnesium	363	--	--	--	131	219	125	424	149	201	158	208	202	84.5	165
Manganese	9.25	65	2,300	180	9.6	6.6	31.2	19	4.5	4.5	5.2	5.9	4.5	3.1	5
Mercury	0.071	1	31	2.4	0.17	0.034 U	0.035	0.037 U	0.035 U	0.035 U	0.033 U	0.036 U	0.033 U	0.033 U	0.034 U
Nickel	2.27	130	2,000	160	0.85	1.5	0.86	2.4	0.76 J	1	1.2	1	1.1	0.8 U	0.83 U
Potassium	361	--	--	--	104	164	109	306	123	139	131	137	145	95	165
Selenium	0.505	2.1	510	39	1.6 U	1.6 U	1.6 U	0.47 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.7 U
Silver	0.129	3.4	510	39	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.083 J	0.17 J	1.6 U	0.086 J
Sodium	68.3	--	--	--	8.3 J	10.8 J	8.6 J	23.1 J	4.6 J	8.3 J	4.1 J	6.2 J	199 U	3.1 J	5.1 J
Vanadium	17.2	--	520	39	7.5 J	13.1 J	6.1 J	16.4	6.1 J	10.4 J	8.4	9.3 J	10.5	4.9 J	9 J
Zinc	6.59	1,200	31,000	2,400	23.7	4 U	51.2	6.6	4 U	4 U	6.5	10.6	4 U	27.8	52.9
Wet Chemistry															
pH	--	--	--	--	4.3	4.6	4.7	4.6	4.4	4.5	NA	4.6	4.2	4.5	4.5

Notes:  
Shading indicates exceedance of two times the mean base background concentration  
Bold box indicates exceedance of NCSSLs  
Bold text indicates exceedance of Adjusted Industrial Soil RSLs  
Underline indicates exceedance of Adjusted Residential Soil RSLs  
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents  
NA - not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - milligrams per kilogram  
µg/kg - micrograms per kilogram



TABLE 5-12  
IR Site 85 Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej, North Carolina

Station ID	Camp Lejeune	NCGWQS	Adjusted Tap	IR85-MW01	IR85-MW02	IR85-MW04	IR85-MW05	IR85-TW04	IR85-TW05	IR85-TW06		IR85-TW07	IR85-TW08
Sample ID	Background GW	(January, 2010)	Water RSLs	IR85-MW01-09C	IR85-MW02-09C	IR85-MW04-09C	IR85-MW05-09C	IR85-TW04-09C	IR85-TW05-09C	IR85-TW06-09C	IR85-TW06D-09C	IR85-TW07-09C	IR85-TW08-09C
Sample Date	2X Mean			07/23/09	07/23/09	07/22/09	07/21/09	07/27/09	07/29/09	07/30/09	07/30/09	07/30/09	07/30/09
Chemical Name													
Volatile Organic Compounds (µg/l)													
Chloroform	--	70	0.19	1 U	6.2	1 U	11 J	1 U	1 U	1 U	1 U	1 U	2.2 UJ
Methylene chloride	--	5	4.8	1 U	1 U	1 UJ	1 UJ	1 U	1 U	190	190	1 U	14 J
Semivolatile Organic Compounds (µg/l)													
No Detections				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (µg/l)													
4,4'-DDD	--	0.1	0.28	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.079 J	0.05 U	0.05 U	0.05 U
Total Metals (µg/l)													
Aluminum	1,886	--	3,700	124 J	873 J	560 J	469 J	182 J	110 J	15,100	9,130	148 J	921 J
Arsenic	5.77	10	0.045	20 U	2 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Barium	86.2	700	730	50 U	56.9	39.6 J	37 J	24.2 J	41.3 J	50 U	50 U	50 U	50 U
Beryllium	0.308	4	7.3	0.11 J	0.27 J	0.17 J	0.11 J	0.098 J	2 U	2 U	2 U	2 U	2 U
Cadmium	0.358	2	1.8	6 U	6 U	0.14 J	6 U	6 U	0.16 J	6 U	6 U	6 U	0.28 J
Calcium	69,078	--	--	569 J	1,330 J	1,960	760 J	579 J	1,130	3,190	3,140	2,200	1,280
Chromium	3.13	10	0.043	20 U	20 U	20 U	20 U	20 U	20 U	18.9 J	11.7 J	20 U	1.8 J
Cobalt	3.4	--	1.1	5 U	0.67 J	0.78 J	5 U	0.89 J	1.2 J	5 U	5 U	0.64 J	5 U
Copper	2.76	1,000	150	20 U	40 U	20 U	20 U	2.4 J	2.4 J	6.8 J	6.2 J	4.1 J	5.6 J
Iron	5,999	300	2,600	166	1,050	425	106 J	531	6,380	6,900	4,770	1,110	1,480
Lead	2.8	15	--	20 U	40 U	2.4 J	20 U	20 U	20 U	15.9 J	12.7 J	20 U	3.7 J
Magnesium	6,363	--	--	1,350	2,310	445	2,480	836	2,510	2,060	1,540	1,160	379
Manganese	214	50	88	8	22	5.8	4.2 J	9.6	72.5	70.8	66.4	29	36.5
Mercury	0.1	1	1.1	0.2 U	0.085 J	0.2 U	0.2 U	0.036 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	7.97	100	73	1.2 J	3 J	1.5 J	10 U	10 U	19.7	7.9 J	6.6 J	9.5 J	2.2 J
Potassium	3,277	--	--	498 J	2,180	496 J	650 J	726 J	813 J	1,210	1,010	624 J	656 J
Selenium	3.14	20	18	20 U	20 U	20 U	20 U	20 U	4.3 J	20 U	20 U	20 U	20 U
Silver	0.77	20	18	20 U	20 U	20 U	20 U	1.5 J	20 U	20 U	20 U	20 U	20 U
Sodium	22,508	--	--	6,620	14,900	4,910	5,140	3,070	4,510	26,800	25,700	2,840	13,200
Zinc	42.1	1,000	1,100	4.4 J	16.6 J	12.6 J	50 U	50 U	30.9 J	48 J	41.1 J	13.7 J	110
Dissolved Metals (µg/l)													
Aluminum	1,886	--	3,700	NA	NA	NA	NA	41.2 J	92.7 J	1,000 U	1,000 U	106 J	1,000 U
Barium	86.2	700	730	NA	NA	NA	NA	23.3 J	41.5 J	50 U	50 U	50 U	50 U
Beryllium	0.308	4	7.3	NA	NA	NA	NA	2 U	0.13 J	2 U	2 U	2 U	2 U
Calcium	69,078	--	--	NA	NA	NA	NA	586 J	1,140	1,000 U	1,000 U	2,130	1,000 U
Chromium	3.13	10	0.043	NA	NA	NA	NA	20 U	20 U	20 U	20 U	1.4 J	20 U
Cobalt	3.4	--	1.1	NA	NA	NA	NA	0.82 J	1.1 J	5 U	5 U	0.76 J	5 U
Copper	2.76	1,000	150	NA	NA	NA	NA	20 U	2.6 J	20 U	2.2 J	5.2 J	20 U
Iron	5,999	300	2,600	NA	NA	NA	NA	433	6,090	150 U	150 U	1,050	144 J
Magnesium	6,363	--	--	NA	NA	NA	NA	817	2,460	250 U	250 U	1,150	130 J
Manganese	214	50	88	NA	NA	NA	NA	9.9	70.1	1.5 J	1.3 J	28.8	15.3
Mercury	0.1	1	1.1	NA	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.04 J	0.2 U
Nickel	7.97	100	73	NA	NA	NA	NA	10 U	19.5	10 U	10 U	9.6 J	1.3 J
Potassium	3,277	--	--	NA	NA	NA	NA	688 J	852 J	506 J	492 J	559 J	624 J
Selenium	3.14	20	18	NA	NA	NA	NA	20 U	4.3 J	20 U	20 U	20 U	20 U
Sodium	22,508	--	--	NA	NA	NA	NA	2,920	4,660	27,300	26,500	2,800	13,600
Zinc	42.1	1,000	1,100	NA	NA	NA	NA	6.8 J	31.5 J	50 U	50 U	13.5 J	49.5 J

Notes:

Shading indicates exceedance of two times the mean base background concentration

Bold box indicates exceedance of NCGWQS

**Bold text indicates exceedance of Adjusted Tap Water RSLs**

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be

µg/l - micrograms per liter



**TABLE 5-13**

IR Site 85 Battery Analytical Data

Camp Johnson Construction Area

*Focused PA/SI Report**MCB CamLej, North Carolina*

<b>Station ID</b>	IR85-BAT
<b>Sample ID</b>	IR85-BAT-071009
<b>Sample Date</b>	07/10/09
<b>Chemical Name</b>	
<b>Total Metals (mg/kg)</b>	
Aluminum	7,460 U
Antimony	149 UJ
Arsenic	2.2 J
Barium	37.3 U
Beryllium	1.5 U
Cadmium	12
Calcium	195 J
Chromium	4.7 J
Cobalt	3.7 U
Copper	250
Iron	1,780
Lead	1,640
Magnesium	98.1 J
Manganese	2,740
Mercury	222
Nickel	5.9 J
Potassium	7,460 U
Selenium	14.9 U
Silver	14.9 U
Sodium	1,870 U
Thallium	NA
Vanadium	373 U
Zinc	45,000

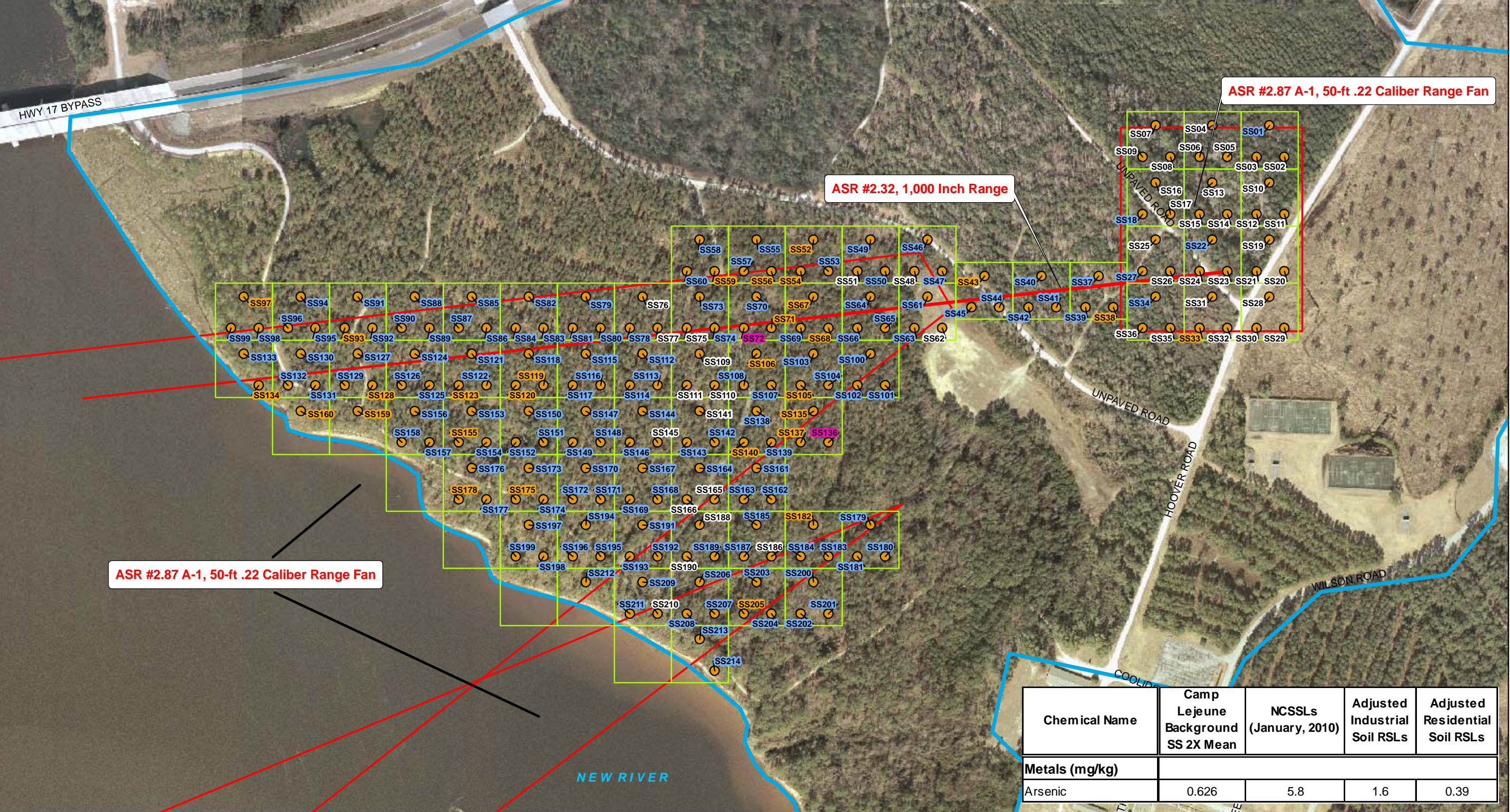
**Notes:**

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate





Chemical Name	Camp Lejeune Background SS 2X Mean	NCSSLs (January, 2010)	Adjusted Industrial Soil RSLs	Adjusted Residential Soil RSLs
Metals (mg/kg)				
Arsenic	0.626	5.8	1.6	0.39

- Legend**
- TR-02-1 Surface Soil Locations
  - 1 Acre Grid
  - Camp Johnson Construction Area
  - UXO-20
  - SS198 Arsenic concentrations exceed both twice the base background and EPA Adjusted Residential Soil RSL
  - SS205 Arsenic concentrations exceed both twice the base background, EPA Adjusted Industrial Soil and Residential Soil RSLs
  - SS136 Arsenic concentrations exceed both twice the base background, NCSSL, and EPA Adjusted Industrial and Residential Soil RSLs

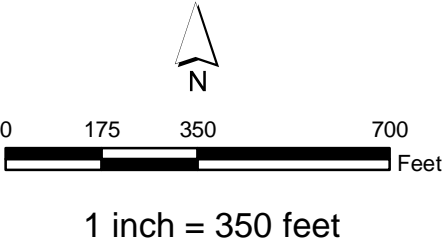
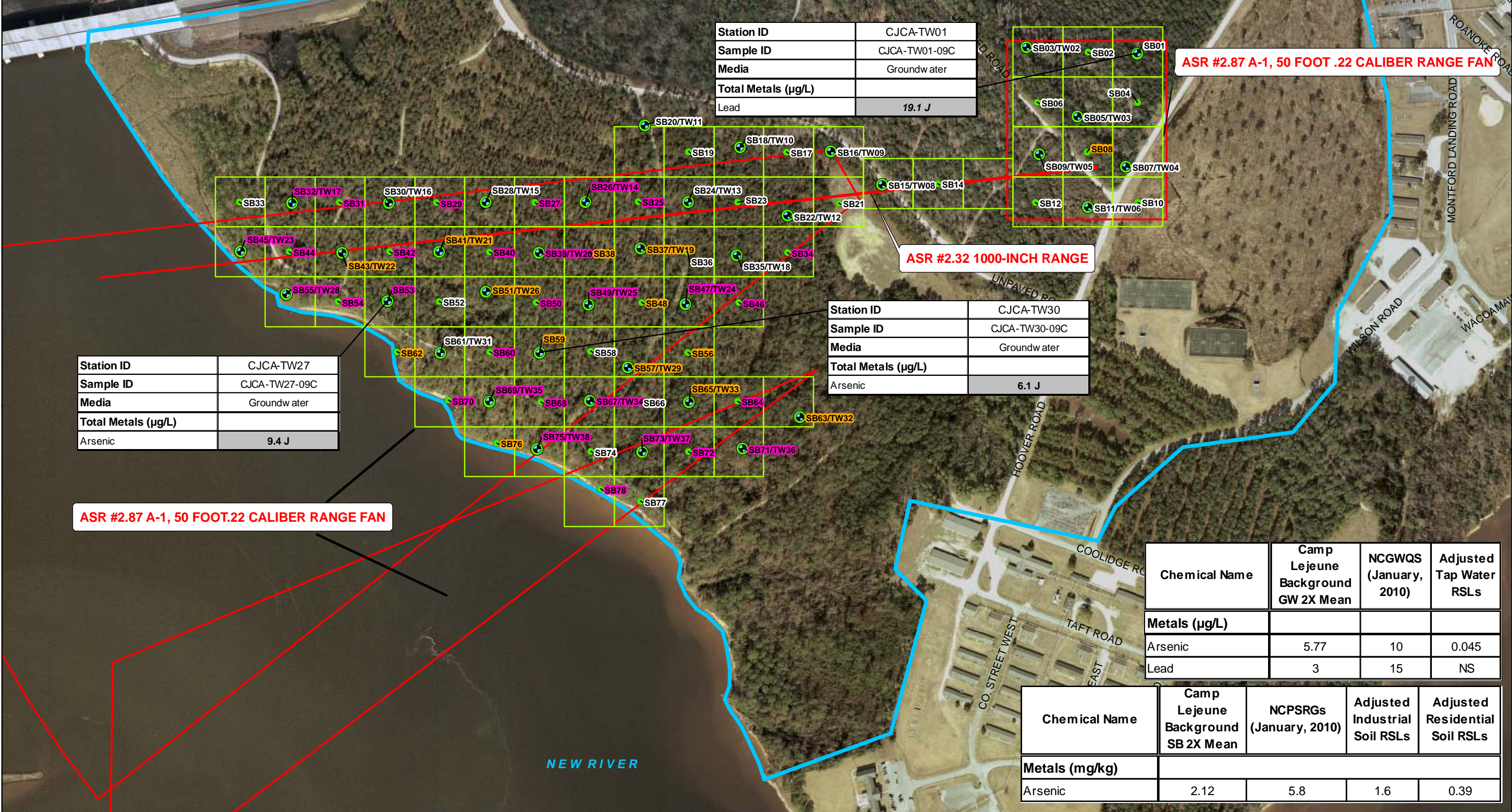


Figure 5-1  
Analytical Exceedances in Surface Soil - UXO-20  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina







- Legend**
- Subsurface Soil Sample
  - ⊕ Subsurface Soil and Groundwater Sample
  - 1 Acre Grid
  - ▭ UXO-20
  - ▭ Camp Johnson Construction Area

- SB62** Arsenic concentrations exceed both twice the base background, EPA Adjusted Industrial Soil and Residential Soil RSLs
- SB70** Arsenic concentrations exceed both twice the base background, NCPSRG, and EPA Adjusted Industrial and Residential Soil RSLs

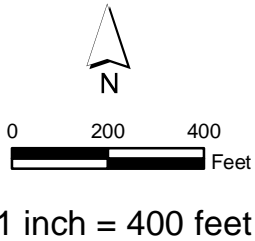
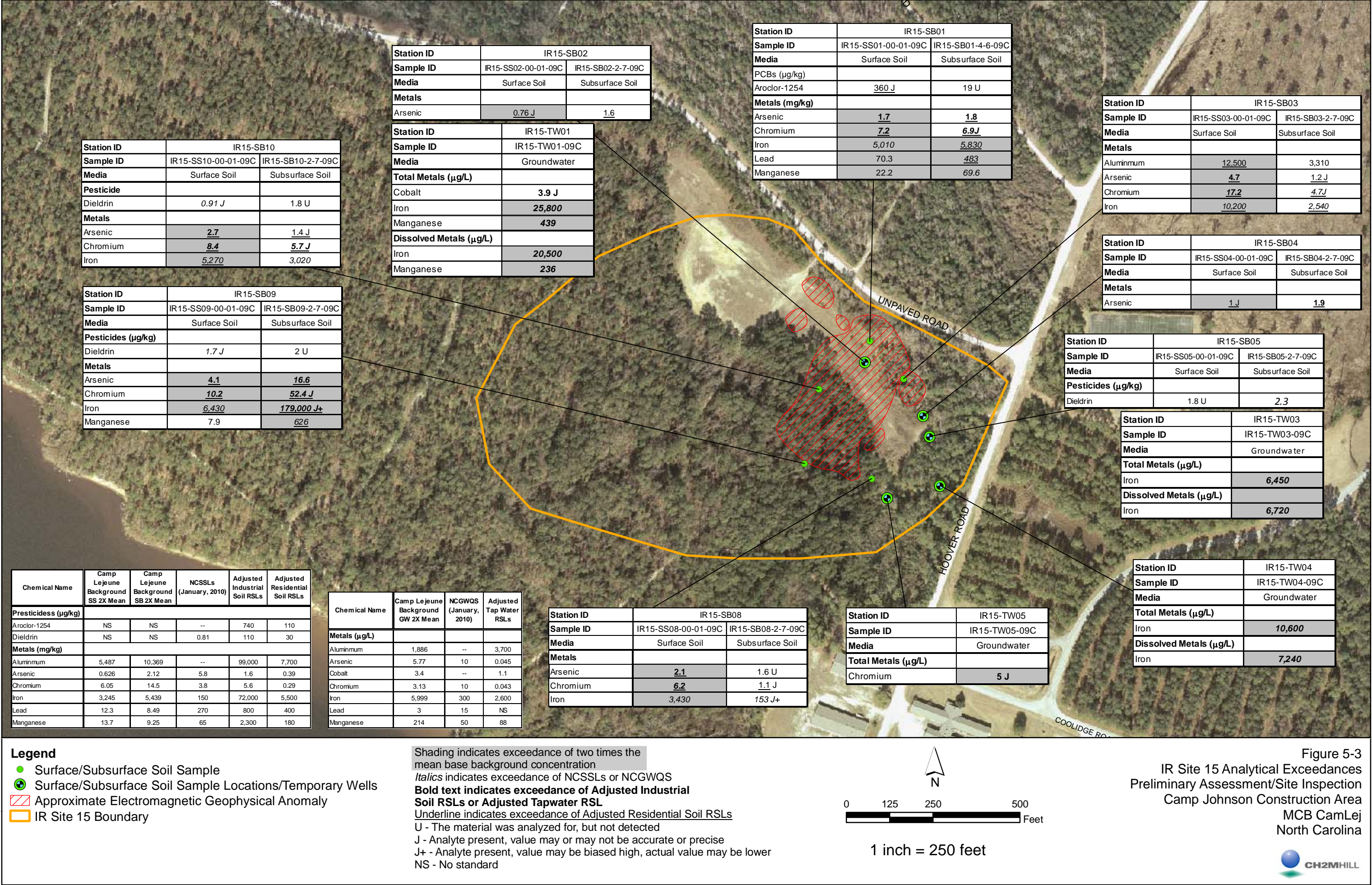


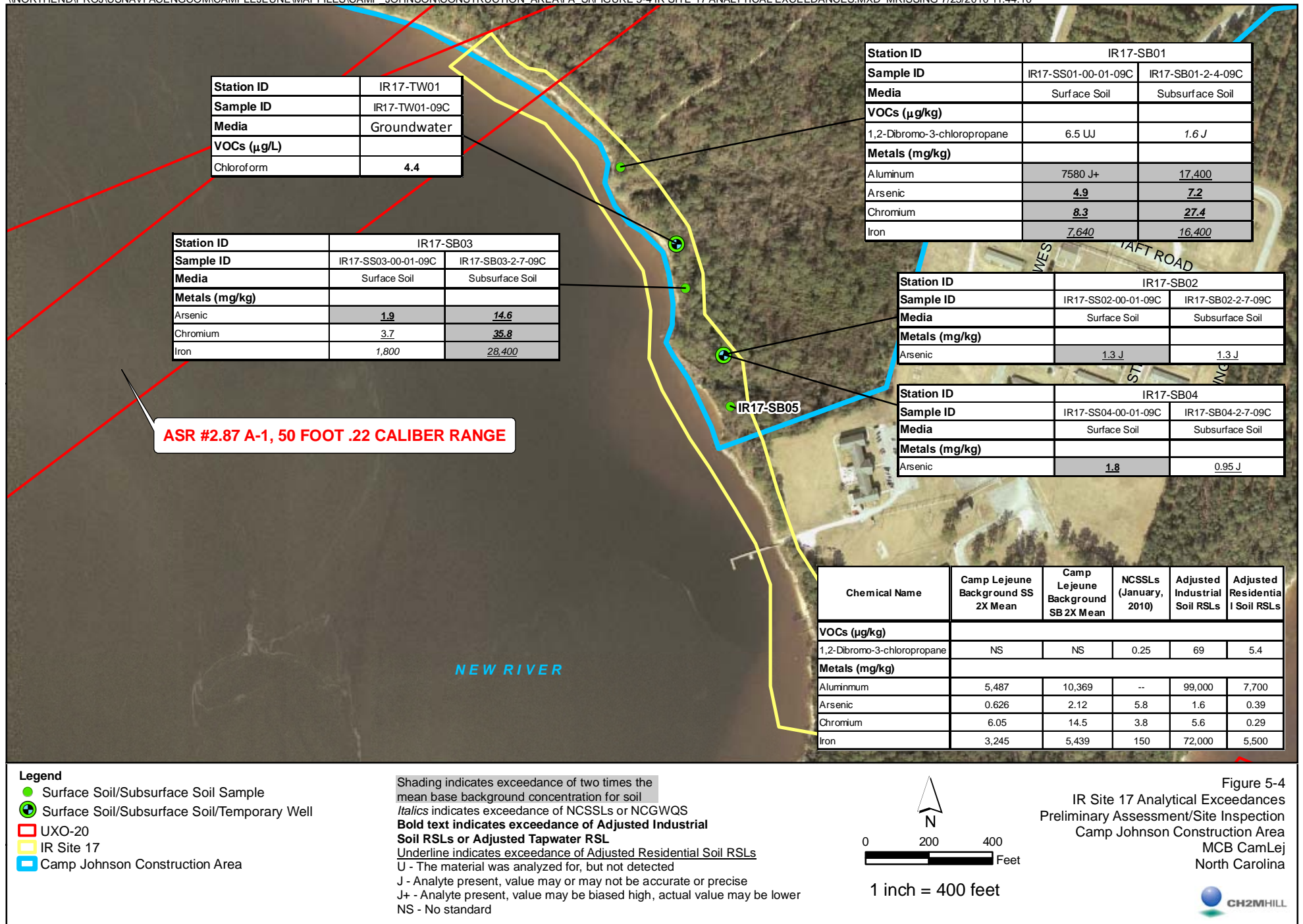
Figure 5-2  
UXO-20 Subsurface Soil and Groundwater Analytical Exceedances  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB CamLej  
North Carolina



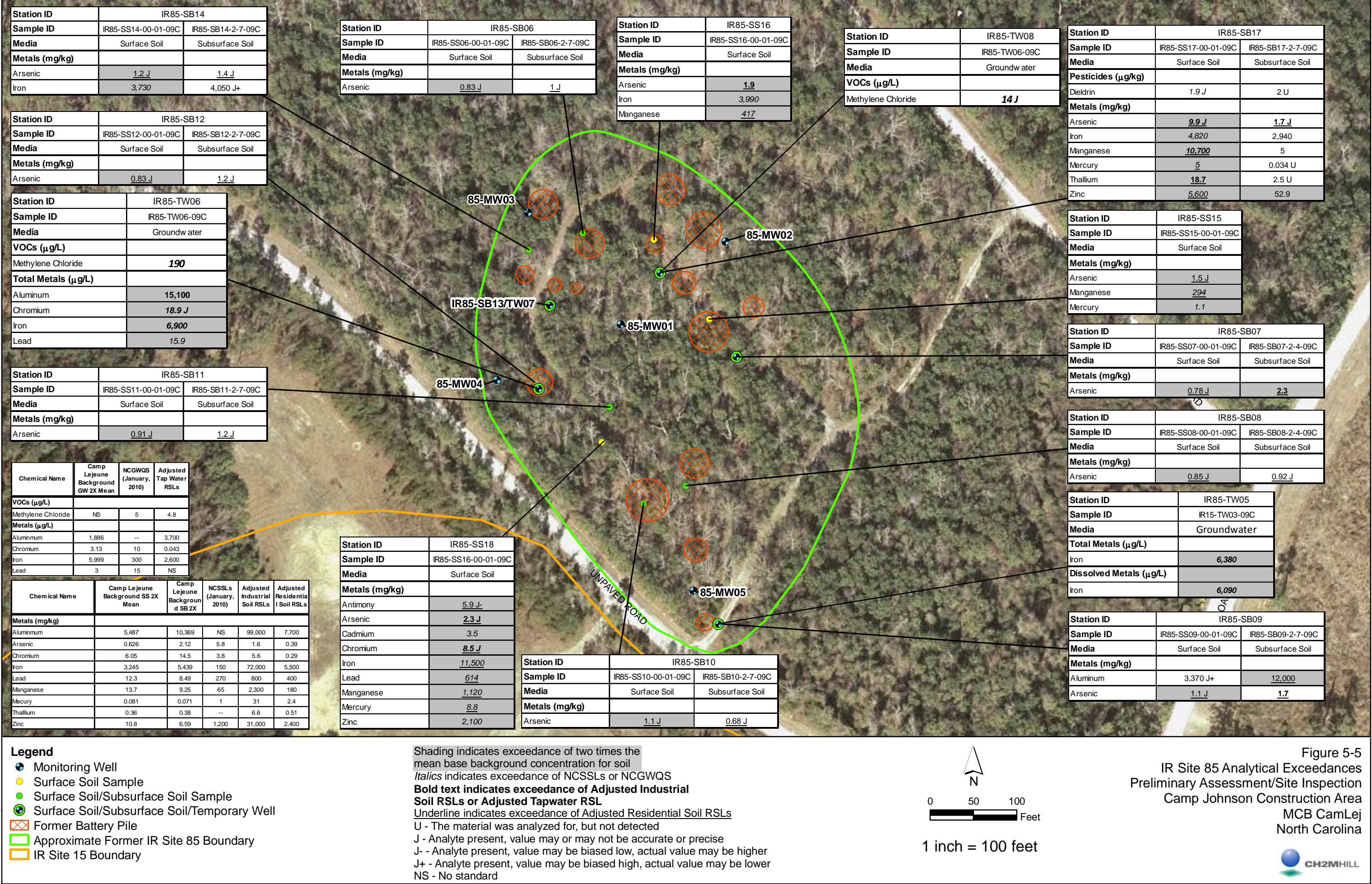














# Human Health Risk Screening

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A conservative preliminary human health risk screening (HHRS) was performed to assess the potential for human health risks associated with exposure to site media (soil and groundwater) at four areas within the CJCA, including UXO-20 and IR Sites 15, 17, and 85. The purpose of the HHRS is to provide a preliminary indication of potential risks from constituents of potential concern (COPCs), and to evaluate whether future residential use is acceptable or if further evaluation is required (e.g., a baseline risk assessment, additional data collection).

The data included in the risk evaluation were validated, and evaluated to determine the reliability of the data for use in the HHRS. A review of the data identified the following criteria for data usability:

- Estimated values flagged with a J and/or P qualifier (including J-, J+, and JP qualifiers) were treated as detected concentrations
- The maximum concentration between parent/duplicate samples was used as the sample concentration
- Unfiltered groundwater samples were analyzed in the risk evaluations following EPA Region IV guidance (EPA, 2000).

## 6.1 Human Health Conceptual Site Model

The human health conceptual site model (CSM) presents an overview of site conditions, potential contaminant migration pathways, and exposure pathways to potential receptors. The human health CSM for soil and groundwater is presented in **Figure 6-1**. Refer to **Section 2.2** for a detailed summary of the site history and setting. A summary of the human health CSM is provided below.

Potential current receptors include visitors, trespassers, Base/industrial workers, and maintenance workers. The current receptors may come in contact with surface soil. Exposure routes may include incidental ingestion of and dermal contact with the surface soil, and inhalation of volatile and particulate emissions from the surface soil.

Potential future receptors include current receptors, and construction workers who perform any future construction projects at the site. Additionally, future residents are included as a worst-case scenario, to evaluate unrestricted future site use. Future receptors could be exposed to surface and subsurface soil if future construction at the site results in re-working the soil, and exposing the subsurface soil. Exposure routes for future exposure to the surface and subsurface soil are the same as those for current surface soil, incidental ingestion of and dermal contact with the soil, and inhalation of volatile and particulate emissions from the soil.



Potable water supplies for MCB CamLej and the surrounding residential area are provided by water supply wells that pump groundwater from the Castle Hayne aquifer; therefore, there is no current exposure to shallow groundwater at the CJCA. The groundwater use patterns are already established for the Base and area around the CJCA, thus use of shallow groundwater from CJCA for industrial or residential purposes is unlikely. Additionally, the surficial aquifer at MCB CamLej is not suitable for potable water use due to high dissolved solids, hardness and fluctuating water levels that negatively affect water yields. However, state and federal governing policies assume that underground fresh water resources are potable, and should be maintained as such; therefore, a potable use scenario was evaluated in this risk assessment. It was conservatively assumed if future residential development of the site occurs the residents could potentially use the groundwater as a potable water supply. The residents would be exposed through ingestion, dermal contact while bathing, and inhalation of VOCs while showering. Additionally, due to the groundwater depth (from 4 to 16 ft bgs), construction workers could be exposed to the groundwater through dermal contact and inhalation of VOCs from an open excavation during construction activities.

Vapor intrusion from groundwater (or soil) to indoor air is not considered a significant exposure pathway for the CJCA. Minimal amounts of VOCs were detected in the groundwater and soil.

## 6.2 Human Health Risk-Based Screening and Risk Ratio Evaluation Methodology

The HHRS was conducted in three steps using a risk ratio technique (Navy, 2000). If COPCs were identified after Step 1, the COPCs were evaluated in Step 2. If COPCs were identified after Step 2, the COPCs were evaluated in Step 3. The three-step screening process is described below:

### 6.2.1 Step 1

The maximum detected analyte concentrations for each medium were compared to EPA RSLs, other human health risk screening levels (if appropriate), and twice the Base background (for inorganics in soil and groundwater). RSLs based on noncarcinogenic effects were divided by 10 to account for exposure to multiple constituents (i.e., were adjusted to a hazard quotient [HQ] of 0.1, from the HQ of 1.0 used on the RSL table). RSLs based on carcinogenic endpoints were used as presented in the RSL table, and are based on a carcinogenic risk of  $1 \times 10^{-6}$ .

The soil data were compared to residential soil RSLs. Residential RSLs are more conservative (i.e., lower) than industrial soil RSLs and are therefore protective of all potential receptors (e.g., residents, industrial workers, construction workers).

The groundwater data were compared to Tap Water RSLs. Groundwater data were also compared to MCLs and the NCGWQS; however, these comparisons were not used to identify the groundwater COPCs to carry forward to Step 2.



If the maximum detected concentration in soil or groundwater exceeded the appropriate screening value and background concentration, the screening level risk evaluation proceeded to Step 2.

In addition to comparing the detected concentrations to the screening levels, the detection limits for non-detected analytes were compared to the screening levels. Non-detected analytes with detection limits exceeding the screening level were not identified as COPCs to carry forward to Step 2, but were discussed below to evaluate the potential for underestimating the total risks.

### 6.2.2 Step 2

For analytes identified as COPCs in Step 1, a corresponding risk level was calculated using the following equation:

$$\text{corresponding risk level} = \frac{\text{concentration} \times \text{acceptable risk level}}{\text{RSL}}$$

The concentration is the maximum detected concentration (the same concentration that was used in Step 1). The acceptable risk level is 1 for noncarcinogens and  $10^{-6}$  for carcinogens. RSLs for noncarcinogenic effects were not adjusted by 10 as was done in Step 1, they are used as presented in the RSL table.

All of the corresponding risk levels for each analyte within a media were summed to calculate the cumulative corresponding hazard index (HI) (for noncarcinogens) and cumulative corresponding carcinogenic risk (for carcinogens). A cumulative corresponding HI was also calculated for each target organ/effect. If the cumulative corresponding HI for a target organ/effect is greater than 0.5, or the cumulative corresponding carcinogenic risk is greater than  $5 \times 10^{-5}$ , the analytes contributing to these values are retained as COPCs and carried forward to Step 3.

### 6.2.3 Step 3

A corresponding risk level was calculated as discussed above for Step 2; however, the 95 percent upper confidence limit (UCL) was used in place of the maximum detected concentration, if more than five samples were available for that media, to obtain a more site-specific risk ratio. If the cumulative corresponding HI by target organ/effect is greater than 0.5, or the cumulative corresponding carcinogenic risk is greater than  $5 \times 10^{-5}$ , then constituents contributing to these values are considered COPCs.

ProUCL Version 4.00.04 (EPA, 2009a) was used to test the data distribution and calculate 95 percent UCL used for the Step 3 risk ratio calculations.



## 6.3 Human Health Risk Screening Results

The HHRS (comparison to risk-based criteria and background levels, Step 1) and risk ratio evaluation (Steps 2 and 3) were performed for UXO-20, Site 15, Site 17, and Site 85 surface soil, combined surface and subsurface soil, and groundwater.

### 6.3.1 UXO-20

#### Surface Soil Risk Screening

Tables 2.1 and 2.1a, **Appendix E**, present the risk-based screening and risk ratio evaluation for surface soil. As shown on Table 2.1 in **Appendix E**, arsenic was identified as a COPC. Based on Step 2 of the screening process (Table 2.1a, **Appendix E**), arsenic was eliminated as a COPC; therefore, exposure to surface soil at UXO-20 would not pose any unacceptable risks, and further evaluation of surface soil based on human health risks is not necessary.

#### Combined Surface and Subsurface Soil Risk Screening

The risk-based screening and risk ratio evaluation for combined surface and subsurface soil data are presented in Tables 2.2 through 2.2b of **Appendix E**. As shown on Table 2.2, **Appendix E**, arsenic exceeded the first step of the screening and was identified as a COPC for evaluation in Step 2. Based on Step 2 (Table 2.2a, **Appendix E**), arsenic was identified as a COPC. Step 3 (Table 2.2b, **Appendix E**) eliminated arsenic as a COPC. Exposure to surface and subsurface soil at UXO-20 would not pose any unacceptable risks, and further evaluation of UXO-20 combined surface and subsurface soil based on human health risks is not necessary.

#### Groundwater Risk Screening

Tables 2.3 through 2.3b, **Appendix E**, present the risk-based screening and risk ratio evaluation for the groundwater. As shown on Table 2.3 in **Appendix E**, arsenic and lead were identified as COPCs. Based on Step 2 of the screening process (Table 2.3a, **Appendix E**), arsenic was identified as a COPC. Lead was eliminated as a COPC because the mean concentration of lead, used in the EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model, is below the screening level. This indicates exposure to lead would not be a risk to residential receptors. Step 3 (Table 2.3b, **Appendix E**) did not eliminate arsenic as a COPC. Therefore, exposure to groundwater could result in an unacceptable risk to human receptors. However, arsenic was only detected in 12 of the 37 samples, and arsenic exceeded background concentrations in only two samples. Therefore, the arsenic may not be associated with site-related activities, but may be associated with background conditions at the base.

#### Non-detected Analytes

Only one metal, antimony, which was not detected in groundwater, had detection limits above the screening level. All of the other metals analyzed for in groundwater and soil samples were detected.



### 6.3.2 IR Site 15

#### Surface Soil Risk Screening

Tables 2.4 through 2.4b, **Appendix E**, present the risk-based screening and risk ratio evaluation for surface soil. As shown on Table 2.4 in **Appendix E**, three SVOCs [chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene], Aroclor-1254, and four metals (aluminum, arsenic, chromium, and iron) were identified as COPCs. The concentration of two of the SVOCs [chrysene and indeno(1,2,3-dc)pyrene] did not exceed the screening level, however they were identified as COPCs following EPA Region 4 risk assessment guidance (EPA, 2000), another chemical, dibenz(a,h)anthracene, from the same chemical class (carcinogenic polycyclic aromatic hydrocarbon) was identified as a COPC. Based on Step 2 of the screening process (Table 2.4a, **Appendix E**), the three polycyclic aromatic hydrocarbon (PAHs), Aroclor-1254, and two of the metals (arsenic and chromium) were identified as COPCs. Step 3 eliminated all of the COPCs, therefore, exposure to surface soil would not pose any unacceptable risks, and further evaluation of Site 15 surface soil based on human health risks is not necessary.

#### Surface and Subsurface Soil Risk Screening

The risk-based screening and risk ratio evaluation for surface and subsurface soil data are presented in Tables 2.5 through 2.5b of **Appendix E**. As shown on Table 2.5 in **Appendix E**, three SVOCs [chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene], Aroclor-1254, and seven metals (aluminum, arsenic, chromium, cobalt, iron, lead, and manganese) were identified as COPCs. The concentration of two of the SVOCs [chrysene and indeno(1,2,3-dc)pyrene] did not exceed the screening level; however they were identified as COPCs following EPA Region 4 risk assessment guidance (EPA, 2000), another chemical, dibenz(a,h)anthracene, from the same chemical class (carcinogenic PAH) was identified as a COPC. Based on Step 2 of the screening process (Table 2.5a, **Appendix E**), the three PAHs, Aroclor-1254, and four of the metals (arsenic, chromium, iron, and lead) were identified as COPCs. Lead was eliminated as a COPC because the mean concentration of lead, used in the IEUBK model, is below the screening level. This indicates exposure to lead would not be a risk to residential receptors. Step 3 eliminated the remaining COPCs; therefore, exposure to surface and subsurface soil would not pose any unacceptable risks, and further evaluation of Site 15 surface and subsurface soil based on human health risks is not necessary.

#### Groundwater Risk Screening

Tables 2.6 through 2.6b, **Appendix E**, present the risk-based screening and risk ratio evaluation for the groundwater. As shown on Table 2.6 in **Appendix E**, chromium, cobalt, iron, and manganese were identified as COPCs. Based on Step 2 of the screening process (Table 2.6a, **Appendix E**), chromium and iron were retained as COPCs. Chromium and iron could not be eliminated as COPCs in Step 3 (Table 2.3b, **Appendix E**). Therefore, exposure to groundwater could result in an unacceptable risk to human receptors associated with exposure to chromium and iron.

Chromium is the only contributor to the carcinogenic risk. Chromium was detected in groundwater samples collected from two of the five temporary monitoring wells. Only the maximum detected concentration exceeded twice the Base background. In the absence of chromium speciation information, the tap water RSL for hexavalent chromium, the more



toxic (and carcinogenic) form of chromium, was used as the screening value for total chromium. The use of hexavalent chromium for comparison to total chromium is extremely conservative because the presence of trivalent chromium is strongly favored in natural waters and because the concentrations of constituents known to reduce hexavalent chromium to trivalent chromium generally far outweigh the concentrations of the few constituents known to oxidize trivalent chromium to hexavalent chromium. Furthermore, once reduced, trivalent chromium is very stable in aquatic environments and highly unlikely to oxidize to hexavalent chromium. Thus, chromium in groundwater is more likely to be in its trivalent form than its hexavalent form (Fendorf and Zasoski, 1992; Milacic and Stupar, 1995; Weaver and Hochella, 2003). The maximum detected concentration of total chromium in the groundwater is below the tap water RSL for trivalent chromium. Additionally, prior to including the New Jersey EPA oral cancer slope factor (CSF) for hexavalent chromium in the RSL table, the groundwater RSL for hexavalent chromium was over three-orders of magnitude higher than the value on the current RSL table. It should also be noted that there is some uncertainty associated with the hexavalent chromium oral CSF, and RSL, as the value is from New Jersey EPA, and has not been included in EPA's Integrated Risk Information System (IRIS) database.

The only contributor to the non-carcinogenic hazard is iron. The maximum detected concentration of iron equals the tap water RSL. The 95 percent UCL concentration of iron is below the EPA Tap Water RSL. The conservative screening level HHRS indicated that potable use of the groundwater could result in an HI of 0.7 associated with the iron. Additionally, iron is an essential nutrient for human health. Therefore, it is unlikely there would be any adverse effects associated with exposure to the iron in Site 15 groundwater.

### Non-detected Analytes

Six SVOCs (benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, bis(2-chloroethyl)ether, hexachlorobenzene, and n-nitroso-di-n-propylamine) and one VOC (1,2-dibromo-3-chloropropane) that were not detected in soil, and had detection limits above the screening levels. However, in general, the detection limits for these analytes in surface and subsurface soil were only slightly above the screening level (were within one order of magnitude of the non-carcinogenic adjusted RSL).

As shown on Table 2.6 in **Appendix E** 20 VOCs and 29 SVOCs were not detected in the groundwater but had detection limits above the screening level. However, due to the limited amount of VOCs and SVOCs detected in the groundwater, it is not expected that they are present in the groundwater, and if they are, it is likely they would be below levels of potential concern for human health because the majority of the detection limits were within an order of magnitude of the RSL or MCL. There were also six metals (antimony, cadmium, lead, selenium, silver, and vanadium) not detected in groundwater with a detection limit above the screening level. The detection limits of these metals were only slightly (within an order of magnitude) above the screening levels.

## 6.3.3 Site 17

### Surface Soil Risk Screening

Tables 2.7 and 2.7a, **Appendix E**, present the risk-based screening and risk ratio evaluation for surface soil. As shown on Table 2.7 in **Appendix E**, three metals (arsenic, chromium, and iron) were identified as COPCs. Based on Step 2 of the screening process (Table 2.7a,



**Appendix E**), none of these metals were identified as COPCs. Therefore, exposure to surface soil would not pose any unacceptable risks, and further evaluation of Site 17 surface soil based on human health risks is not necessary.

### Combined Surface and Subsurface Soil Risk Screening

The risk-based screening and risk ratio evaluation for surface and subsurface soil data are presented in Tables 2.8 through 2.8b of **Appendix E**. As shown on Table 2.8 in **Appendix E**, five metals (aluminum, arsenic, chromium, iron, and vanadium) were identified as COPCs. Based on Step 2 of the screening process (Table 2.8a, **Appendix E**), arsenic and chromium were identified as COPCs. Step 3 did not eliminate either arsenic or chromium from consideration as COPCs. Chromium is the main contributor to the potential carcinogenic risk associated with the subsurface soil, and the only COPC with a cancer risk above  $5 \times 10^{-5}$ . Elimination of chromium as a COPC would also result in elimination of arsenic as a COPC, because it doesn't contribute significantly (above  $5 \times 10^{-5}$ ) to the cumulative calculated risk.

The soil samples collected at Site 17 were analyzed for total chromium, and in the absence of chromium speciation data, it was assumed that hexavalent chromium contributed to the concentrations. Therefore, hexavalent chromium, the more toxic (and carcinogenic) form of chromium, was used as the screening value for total chromium. In order to determine the concentrations of hexavalent and trivalent chromium, additional subsurface soil samples were collected from sample locations IR17-SB01 through IR17-SB05 in July 2010. The samples were submitted for laboratory analysis of total and hexavalent chromium. Trivalent chromium concentrations were determined by subtracting the hexavalent chromium concentrations from the total chromium concentrations. The hexavalent and trivalent chromium concentrations were screened against their respective RSLs, as shown on Table 2.9 of **Appendix E**. Step 1 of the screening process eliminated trivalent chromium as a COPC. Based on Step 2 of the screening process (Table 2.9a, **Appendix E**) hexavalent chromium was eliminated as a COPC. The elimination of chromium as a COPC also eliminated arsenic as a COPC; therefore exposure to Site 17 soil would not result in an unacceptable risk to human receptors. Further evaluation of soil at Site 17 based on human health risks is not necessary.

### Groundwater Risk Screening

Tables 2.10 and 2.10a, **Appendix E**, present the risk-based screening and risk ratio evaluation for the groundwater. As shown on Table 2.10 in **Appendix E**, chloroform was identified as a COPC. Based on Step 2 of the screening process (Table 2.10a, **Appendix E**), chloroform was not identified as a COPC. Therefore, exposure to Site 17 groundwater would not result in an acceptable risk to human receptors and further evaluation of groundwater at Site 17 based on human health is not necessary.

### Non-detected Analytes

Three SVOCs (benzo(a)pyrene, bis(2-chloroethyl)ether, and dibenz(a,h)anthracene) and one VOC (1,2-dibromo-3-chloropropane) were not detected in soil that had detection limits above the screening level. However, in general, the detection limits for these analytes in surface and subsurface soil were only slightly above the screening level (were within one order of magnitude of the non-carcinogenic adjusted RSL). As shown on Table 2.9 in **Appendix E** 20 VOCs and 29 SVOCs were not detected in the groundwater but had detection limits above the screening level. However, due to the limited VOCs and SVOCs



detected in the groundwater, it is not expected that they are present in the groundwater, and if they are, it is likely they would be below levels of potential concern for human health because the majority of the detection limits were within an order of magnitude of the RSL or MCL.

### 6.3.4 Site 85

#### Surface Soil Risk Screening

Tables 2.11 through 2.11b, **Appendix E**, present the risk-based screening and risk ratio evaluation for surface soil. As shown on Table 2.11 in **Appendix E**, nine metals (antimony, arsenic, chromium, cobalt, iron, lead, manganese, mercury, and zinc) were identified as COPCs. Based on Step 2 of the screening process (Table 2.11a, **Appendix E**), two metals, lead and manganese, were identified as COPCs. Lead was eliminated as a COPC because the mean concentration of lead, used in the IEUBK model, is below the screening level. This indicates exposure to lead would not be a risk to residential receptors. Step 3 of the screening process identified manganese as a COPC. Manganese was only detected in one of the 13 surface soil samples at a concentration above the RSL. This detected concentration was 10 times higher than the next highest detection. Therefore, the potential risk associated with manganese is associated with only one sample. Additionally, manganese is an essential human nutrient.

#### Surface and Subsurface Soil Risk Screening

The risk-based screening and risk ratio evaluation for surface and subsurface soil data are presented in Tables 2.12 through 2.12b of **Appendix E**. As shown on Table 2.12 in **Appendix E**, ten metals (aluminum, antimony, arsenic, chromium, cobalt, iron, lead, manganese, mercury, and zinc) were identified as COPCs. Based on Step 2 of the screening process (Table 2.12a, **Appendix E**), five metals (aluminum, arsenic, chromium, lead, and manganese) were identified as COPCs. Lead was eliminated as a COPC because the mean concentration of lead, the lead concentration used in the IEUBK model to evaluate exposure to lead, is below the screening level, indicating exposure to lead would not be a risk to residential receptors. Based on Step 3 aluminum and manganese were identified as COPCs.

Manganese was only detected in 1 of the 23 soil samples at a concentration above the RSL. This detected concentration was 10 times higher than the next highest detection. Therefore, the potential risk associated with manganese is associated with only one sample. Additionally, manganese is an essential human nutrient. Aluminum was identified as a COPC because it affects the same target organ as manganese. Aluminum alone does not contribute a hazard above the acceptable screening level HI of 0.5.

#### Groundwater Risk Screening

Tables 2.13 and 2.13b, **Appendix E**, present the risk-based screening and risk ratio evaluation for the groundwater. As shown on Table 2.13 in **Appendix E**, two VOCs (chloroform and methylene chloride) and four metals (aluminum, chromium, iron, and lead), were identified as COPCs. Based on Step 2 of the screening process (Table 2.13a, **Appendix E**), the chloroform, methylene chloride, chromium, and lead were identified as COPCs. Lead was eliminated as a COPC because the mean concentration of lead, the lead concentration used in the IEUBK model to evaluate exposure to lead, is below the screening



level indicating exposure to lead would not be a risk to residential receptors. After Step 3, chloroform, methylene chloride, and chromium were identified as COPCs.

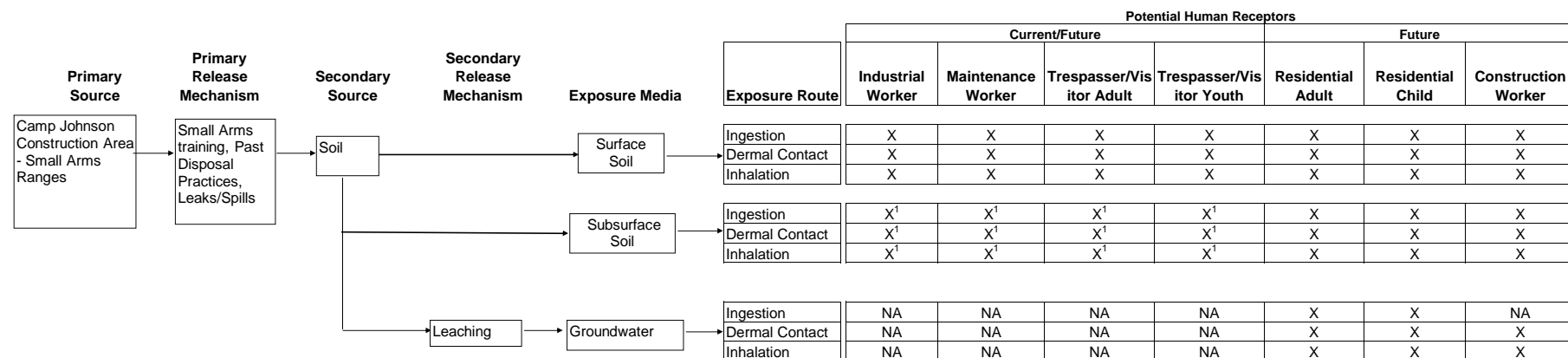
Chloroform and methylene chloride are common laboratory contaminants and may not be associated with site use. Chromium was detected in groundwater samples collected from two of the nine temporary monitoring wells. Only the maximum detected concentration exceeded twice the Base background. In the absence of chromium speciation information, the tap water RSL for hexavalent chromium, the more toxic (and carcinogenic) form of chromium, was used as the screening value for total chromium. The use of hexavalent chromium for comparison to total chromium is extremely conservative because the presence of trivalent chromium is strongly favored in natural waters and because the concentrations of constituents known to reduce hexavalent chromium to trivalent chromium generally far outweigh the concentrations of the few constituents known to oxidize trivalent chromium to hexavalent chromium. Furthermore, once reduced, trivalent chromium is very stable in aquatic environments and highly unlikely to oxidize to hexavalent chromium. Therefore, chromium in groundwater is more likely to be in its trivalent form than its hexavalent form (Fendorf and Zasoski, 1992; Milacic and Stupar, 1995; Weaver and Hochella, 2003). The maximum detected concentration of total chromium in the groundwater is below the tap water RSL for trivalent chromium. Additionally, prior to including the New Jersey EPA oral CSF for hexavalent chromium in the table, the groundwater RSL for hexavalent chromium was more than three orders of magnitude higher than the value on the current RSL table. It also needs to be noted that there is some uncertainty associated with the hexavalent chromium oral CSF, and RSL, because the value is from New Jersey EPA and has not been included in EPA's Integrated Risk Information System (IRIS) database.

### Non-detected Analytes

Three SVOCs (benzo(a)pyrene, bis(2-chloroethyl)ether, and dibenz(a,h)anthracene) that were not detected in soil that had detection limits above the screening level. However, in general, the detection limits for these analytes in surface and subsurface soil were only slightly above the screening level (were within one order of magnitude of the non-carcinogenic adjusted RSL). As shown on Table 2.13 in **Appendix E**, there were 20 VOCs and 31 SVOCs in groundwater that were not detected but had detection limits above the screening level. However, due to the limited amount of VOCs and SVOCs detected in the groundwater, it is not expected that they are present in the groundwater, and if they are, it is likely they would be below levels of potential concern for human health because the majority of the detection limits were within an order of magnitude of the RSL or MCL. There were also two metals (antimony and vanadium) not detected in groundwater with a detection limit above the screening level. The detection limits of these metals were only slightly above the screening levels.



**FIGURE 6-1**  
 Conceptual Site Model for HHRA  
 Preliminary Assessment/Site Inspection  
 Camp Johnson Construction Area  
 MCB CamLej, North Carolina



<sup>1</sup>Current receptor populations may be exposed to surface soil. Future receptor populations may be exposed to surface and subsurface soil.  
 NA - Not Applicable or pathway is incomplete  
 X - Potentially complete exposure pathways

Created by: D. Stannard  
 Checked by: B. Propst



# Preliminary Ecological Risk Screening

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An ecological risk screening (ERS) was conducted for four sites at Camp Johnson – UXO-20, Site 15, Site 17, and Site 85. Analytical data from surface soil, subsurface soil, and groundwater samples were screened against benchmarks intended to be protective of ecological receptors. All data considered in the screening were collected during the 2009 sampling events, except for some historical data that were included as part of the screening for Site 15.

## 7.1 Site Ecological Setting and Available Data

The following section provides information on site ecological setting and available data for UXO-20, IR Site 15, IR Site 17, and IR Site 85. No jurisdictional wetlands have been identified within the CJCA boundary.

### 7.1.1 UXO-20

The area of investigation is approximately 90 percent vegetated with trees and thick undergrowth.

Data from the following samples were considered in the screen:

- 214 surface soil samples (plus 31 duplicates) from 0 to 1 ft bgs.
- 67 subsurface soil samples (plus 7 duplicates) collected from 2 to 7 ft bgs
- 37 groundwater samples (plus 3 duplicates). Dissolved metals data were available for a subset of the wells. Groundwater from UXO-20 is assumed to discharge to marine waters.

### 7.1.2 IR Site 15

Site 15 consists of an open area surrounded by vegetation, and encompasses approximately 24 acres. However, historical investigations indicate the former disposal area covers only about 2 acres in the eastern portion of the site. Site 15 is predominately vegetated with trees and thick undergrowth. One area of bare disturbed ground is present in the northeastern portion of the site.

Data from the following samples were considered in the screen:

- Seven surface soil samples were collected in 2006 (SWMU46 samples).
- 10 surface samples (plus one duplicate) collected in 2009 from 0 to 1 ft bgs.
- 10 subsurface soil samples (plus one duplicate) collected from 0 to 5 ft bgs in 2009.
- 5 groundwater samples (plus 1 duplicate) collected in 2009. Dissolved metals data were available for all of the wells. Groundwater from Site 15 is assumed to discharge to marine waters.



### 7.1.3 IR Site 17

Site 17 consists of an area of approximately 5 acres covered by concrete debris, located along the shoreline of the New River.

Data from the following samples were considered in the screen:

- 5 surface soil samples (plus one duplicate) were collected from 0 to 1 ft bgs.
- 5 subsurface soil samples (plus one duplicate) collected from 0 to 5 ft bgs
- 2 groundwater samples (plus one duplicate) Dissolved metals data were also available. Groundwater from Site 17 is assumed to discharge to marine waters.

### 7.1.4 IR Site 85

Site 85 encompasses approximately 4.5 acres in the Camp Johnson support operations area of MCB CamLej. Site 85 is predominately vegetated with trees and thick undergrowth.

Data from the following samples were considered in the screen:

- 13 surface soil samples (plus two duplicates) collected from 0 to 1 ft bgs
- 10 subsurface soil samples (no duplicates) collected from 0 to 5 ft bgs
- 9 groundwater samples (plus one duplicate). Dissolved metals data were available for a subset of the wells. Groundwater from Site 85 is assumed to discharge to marine waters.

## 7.2 Screening Methodology

For each medium (surface soil, subsurface soil, and groundwater), the maximum and average concentrations are presented in **Tables F-1** through **F-12** along with representative ecological screening values (ESVs) intended to be protective of ecological receptors. HQs were calculated by dividing these exposure concentrations by the ESVs. It should be noted that ESVs for inorganics in water are generally based on dissolved concentrations and comparing them to total metals concentrations is conservative and may over-represent risk.

For locations with multiple data points (i.e., a parent and duplicate sample were available), data were reduced to the value of the greatest detected concentration or highest detection limit if there was no detection. Where average concentrations are reported, one half of the detection limit was used for non-detects as the representative concentration when determining the average.

For soil, the EPA ecological soil screening levels (EPA, 2009b) were preferentially selected over Region 4 values (EPA, 2001). When no ecological soil screening level was available for a constituent, the Region 4 value was selected.

A selection hierarchy was also applied to groundwater. The national recommended water quality criteria (NRWQC) were preferentially selected over the Region 4 value (EPA, 2009c). However, when no NRWQC was available for a constituent, the Region 4 value was selected as the ESV for that constituent. It is assumed that groundwater discharges to marine waters; therefore, marine ESVs were selected.



A base background study for inorganics was conducted at MCB CamLej in June and July 2000 (Baker, 2001). As part of the ERS, surface soil, subsurface soil, and groundwater background concentrations were compared to site-specific media concentrations. Additional lines of evidence in the evaluation include the frequency of detection, frequency of exceedance, magnitude of exceedance, and identification of potential laboratory contaminants.

Calcium, magnesium, potassium, and sodium were evaluated but not considered as COPCs in the ERS. Each is considered a macronutrient (Whitehead, 2000).

## 7.3 Screening Results

This section addresses constituents that were detected and had available ESVs based on the selection hierarchy discussed above for the four evaluated sites. Constituents not detected are not expected to pose a risk to ecological receptors. The ERS results are presented in **Appendix F**.

### 7.3.1 UXO-20

#### Surface Soil

Three detected constituents had concentrations in excess of ESVs (antimony, lead, and zinc) (**Table F-1**). The maximum concentration of antimony exceeded twice the mean background but was within the Base background range for surface soils at MCB CamLej and is considered to be representative of background.

Lead and zinc concentrations exceeded the ESVs and were above the background ranges for surface soil. However, lead only exceeded the Region 4 screening level in 1 of 214 samples and the background concentration in 2 of 214 samples, suggesting that lead is likely consistent with background and is not considered to pose a risk to ecological receptors. While zinc had an HQ above one, the frequency (3/214) and magnitude of exceedance (HQ = 2.5) were low and the mean HQ was less than 1.0. Consequently, inorganics in surface soil at the former range fans are not expected to pose risk to ecological receptors.

#### Subsurface Soil

Of the detected constituents, arsenic, lead, and zinc had concentrations in excess of the ESVs (**Table F-2**). The maximum concentration of lead exceeded twice the Base background but was within the background range for surface soils at MCB CamLej and is considered to be representative of background.

Arsenic and zinc concentrations exceeded the ESVs with respective maximum-based HQs of 1.38 and 1.07. Because the frequency and magnitude of exceedance was low for both analytes, risk is considered low. Consequently, inorganics are not expected to pose a significant risk to ecological receptors.

#### Groundwater

Of the total inorganics, three detected constituents had concentrations in excess of the selected ESVs including copper, lead, and zinc (**Table F-3**). While the maximum concentrations of each analyte exceeded twice the mean background, these concentrations were within the background range for groundwater at MCB CamLej and are considered to



be representative of background. Consequently, none of these constituents are expected to pose a significant risk.

Of the dissolved inorganics, copper and zinc were the only analytes with a maximum concentration greater than the ESV. The maximum concentrations, however, were within the respective background ranges for shallow groundwater. Consequently, dissolved inorganics are not expected to pose a significant risk to ecological receptors.

### 7.3.2 IR Site 15

#### Surface Soil

Seven detected organic constituents and nine inorganic constituents had concentrations in excess of ESVs (**Table F-4**). Of these organics, all analytes, with the exception of chloroform and Aroclor-1254, had low frequencies and/or magnitudes of exceedance. While chloroform had an HQ of 5.2, it is a common lab contaminant (California Department of Toxic Substances Control [CDTSC], 2006) and only a limited number of VOCs were detected. Aroclor-1254 had a low frequency of detection (1/15) but had an elevated HQ of 18.

Of the inorganics, aluminum, antimony, iron, and vanadium exceeded twice the Base background; however, the concentrations were within the respective background ranges. Cadmium, copper, lead (based on the Region 4 ESV), and zinc were all found to have low frequencies of detection and/or magnitudes of exceedance and risk from these analytes is considered low. Mercury had a maximum-based HQ of 5.1 and a mean-based HQ of less than 1.0.

While ecological risks are generally low for inorganic analytes, the majority of predicted risk is from one sample location (IR15-SS01). This sample location is co-located with the maximum Aroclor-1254 detection. Because this area is not well characterized, additional investigation to delineate the nature and extent of inorganics and PCBs in this area is recommended.

#### Subsurface Soil

Of the detected constituents, 3 pesticides (4, 4'-DDD, 4, 4'-DDE, and 4, 4'-DDT) and 12 inorganics had concentrations in excess of the ESVs (**Table F-5**). The pesticides were all elevated in IR15-SB10 and had HQs ranging from 2.19 to 8.54. Because sampling in this area is limited and HQs were elevated, additional investigation is recommended to evaluate these pesticides (particularly, 4,4'-DDE, and 4,4'-DDT).

Of the inorganics, aluminum and vanadium had maximum concentrations that were consistent with MCB CamLej background levels and are not considered to pose a significant risk to ecological receptors. Cadmium, chromium, copper, manganese, and thallium all had low frequencies and/or magnitudes of exceedances. Additionally, the majority of these analytes had mean-based HQs less than 1.0. Antimony, iron, lead, and zinc all had maximum-based HQs and mean-based HQs above 1.0. Although inorganics in subsurface soil are not expected to pose significant risks to ecological receptors, additional investigation is recommended for inorganics in subsurface soils at Site 15. It should also be noted that the majority of subsurface contamination is collocated with surface contamination found in IR15-SS01.



## Groundwater

Of the detected inorganics in groundwater, only copper and nickel, had concentrations in excess of the selected ESVs (**Table F-6**). However, while both analytes exceed twice the Base background, they are both within the respective background range based on total and dissolved concentrations. Consequently, neither of these constituents is expected to pose a significant risk.

### 7.3.3 IR Site 17

#### Surface Soil

Six detected constituents had concentrations in excess of ESVs including one organic (chloroform) and five inorganics (aluminum, iron, lead, selenium, and vanadium) (**Table F-7**). While chloroform had an elevated HQ, it is a common lab contaminant (CDTSC, 2006) and was the only VOC detected in excess of the ESV.

The maximum concentrations of all five inorganics were twice the Base background but were within the respective background ranges for surface soils at MCB CamLej and are considered to be representative of background.

#### Subsurface Soil

Of the detected constituents, only one organic (chloroform) and seven inorganics had concentrations in excess of the ESVs (**Table F-8**). Aluminum had a maximum concentration (20,000 mg/kg) that was greater than the background range (260 to 16,800 mg/kg) and a maximum- and mean-based HQ above 1.0. Antimony had a low magnitude of exceedance and was greater than the ESV in only one of five samples. Chromium, lead, and selenium had maximum-based HQs greater than 1.0, but mean-based HQs less than 1.0. Additionally, these analytes each had a low magnitude of exceedance based on the maximum detection and lead had a maximum-based HQ of less than 1.0 when using the Region 4 screening value of 50 mg/kg. Iron and vanadium both had maximum- and mean-based HQs greater than 1.0. While aluminum, iron, and vanadium all had elevated HQs, these analytes are not thought to be the result of site-related activities because Site 17 was a surface dumping site. Surface soils at this site are not significantly affected and it is unlikely that inorganics in subsurface soils would be elevated as a result of surface disposal. Additionally, the area was a disposal site for concrete debris and is unlikely to have contributed to metals contamination in soils.

## Groundwater

Of the detected inorganics in groundwater, only copper and nickel, had concentrations in excess of the selected ESVs (**Table F-9**). However, while both analytes exceed twice the Base background, they are both within the respective background range based on total and dissolved concentrations. Consequently, neither of these constituents is expected to pose a significant risk.

### 7.3.4 IR Site 85

#### Surface Soil

Fifteen detected constituents had concentrations in excess of ESVs, including 4 organics (bis[2-ethylhexyl]phthalate; 4,4'-DDE; 4,4'-DDT, and Aroclor-1254) and 11 inorganics (**Table F-10**). Of these, the organic analytes were found to have a low frequency of



occurrence and/or magnitude of exceedance and mean HQs less than 1.0. Additionally, phthalates are known to be common laboratory contaminants (CDTSC, 2006).

Of the inorganics, the maximum concentrations of aluminum, iron, and vanadium exceeded twice the mean background but were within the background range for surface soils at MCB CamLej and are considered to be representative of background. The remaining inorganics (antimony, cadmium, copper, lead, manganese, mercury, thallium, and zinc) had high magnitudes of exceedance and were well outside the respective background ranges. Consequently, these inorganics are considered to pose potential risk to ecological receptors and additional evaluation is recommended.

### Subsurface Soil

Of the detected constituents, two organics (chloroform and 4,4'-DDE) and five inorganics (aluminum, iron, mercury, vanadium, and zinc) had concentrations in excess of the ESVs (**Table F-11**). Both organic analytes had a low magnitude of exceedance and a mean-based HQ less than 1.0. Additionally, chloroform is known to be a common laboratory contaminant (CDTSC, 2006).

For inorganics, the iron and vanadium maximum concentrations were consistent with MCB CamLej background levels and are not considered to pose a significant risk to ecological receptors. The maximum concentration of aluminum exceeded twice the Base background but was within the background range for subsurface soils at MCB CamLej and is considered to be representative of background. Mercury and zinc both had a low magnitude of exceedance (maximum-based HQs less than 2.0) and mean HQs less than 1.0. Additionally, the maximum mercury concentration (0.17 mg/kg) only slightly exceeds the maximum background value (0.16 mg/kg). Consequently, an ecological risk from analytes in subsurface soil is considered negligible.

### Groundwater

Six detected constituents had concentrations in excess of the selected ESVs, including 4,4'-DDD, copper, lead, nickel, silver, and zinc (**Table F-12**). The magnitude of exceedance for 4, 4'-DDD was low and it was detected in only 1 of 9 samples. It is unlikely that concentrations of pesticides in groundwater are related to battery disposal that occurred at the site but rather the result of application of pesticides at the Base.

The maximum concentration of zinc is within the MCB CamLej background range for groundwater. While total concentrations of lead, silver, and zinc were above background, they were consistent with background based on dissolved data. Additionally, while copper (total and dissolved) and nickel (total and dissolved) concentrations in groundwater were above respective background ranges, concentrations in subsurface soils at the site were consistent with background, suggesting that elevated concentrations of inorganics in groundwater are not site-related. Consequently, none of these constituents are expected to pose a significant risk.

## 7.4 Supplemental Evaluation

This section addresses constituents that were detected but did not have ESVs based on the selection hierarchy discussed above. Supplemental values were selected as available from *Update to Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas*



(Texas Commission of Environmental Quality, 2006), screening quick reference tables (Buchman, 2008), and other publications, as needed. These comparisons are discussed along with other lines of evidences, such as frequency of detection and relationship to the range of background concentrations. It should be noted that supplemental ESVs were not needed for the former range fans and these areas are not discussed in this section.

### 7.4.1 IR Site 15

#### Surface Soil

In surface soil, 2-butanone, acetone, and methyl acetate were the only detected organic constituents lacking an ESV. Inorganic analytes lacking ESVs were all macronutrients which are not considered to be COPCs. The maximum concentrations of 2-butanone and acetone were less than the supplemental ESVs. These analytes are not expected to pose a significant risk to ecological receptors. A supplemental ESV was not available for methyl acetate.

#### Subsurface Soil

In subsurface soil, 2-butanone, 2-hexanone, 4-methyl 2-pentanone, acetone, carbon disulfide, and methyl acetate were the only detected organic constituents lacking an ESV. Inorganic analytes lacking ESVs were all macronutrients, which are not considered to be COPCs. Supplemental ESVs were available for all analytes except methyl acetate, and the maximum concentrations of these analytes were less than the supplemental ESVs.

#### Groundwater

In groundwater, isopropylbenzene and styrene were detected but lacked ESVs. The concentrations for these two constituents were below supplemental ESVs, and the risk to ecological receptors is considered negligible. While ESVs were lacking for several inorganic constituents, these constituents were considered to be (1) consistent with background, (2) within the respective background range, or (3) a macronutrient. Consequently, none of these constituents are considered to pose significant risk.

### 7.4.2 IR Site 17

#### Surface Soil

In surface soil, 2-butanone, acetone, chloromethane, and methyl acetate were the only detected organic constituents lacking an ESV. Inorganic analytes lacking ESVs were all macronutrients, which are not considered to be COPCs. The maximum concentrations of 2-butanone, acetone, and chloromethane were less than the supplemental ESVs. These analytes are not expected to pose a significant risk to ecological receptors. A supplemental ESV was not available for methyl acetate.

#### Subsurface Soil

In subsurface soil, 1,2-dibromo-3-chloropropane, 2-butanone, acetone, and methyl acetate were the only detected organic constituents lacking an ESV. Inorganic analytes lacking ESVs were all macronutrients, which are not considered to be COPCs. The maximum concentrations of 2-butanone and acetone were less than the supplemental ESVs. These analytes are not expected to pose a significant risk to ecological receptors. Supplemental ESVs were not available for methyl acetate and 1,2-dibromo-3-chloropropane.



## Groundwater

In groundwater, caprolactam and several inorganics were detected but lacked ESVs. A supplemental ESV was not available for caprolactam. While ESVs were lacking for several inorganic constituents, these constituents were considered to be (1) consistent with background, (2) within the respective background range, or (3) a macronutrient. Consequently, none of these constituents are considered to pose significant risk.

### 7.4.3 IR Site 85

#### Surface Soil

In surface soil, 2-butanone, acetone, and methyl acetate were the only detected organic constituents lacking an ESV. Inorganic analytes lacking ESVs were all macronutrients, which are not considered to be COPCs. The maximum concentrations of 2-butanone and acetone were less than the supplemental ESVs. These analytes are not expected to pose a significant risk to ecological receptors. A supplemental ESV was not available for methyl acetate.

#### Subsurface Soil

In subsurface soil, 1,2-dibromo-3-chloropropane, 2-butanone, 4-methyl 2-pentanone, acetone, isopropylbenzene, and methyl acetate were the only detected organic constituents lacking ESVs. Inorganic analytes lacking ESVs were all macronutrients, which are not considered to be COPCs. Supplemental ESVs were available for all analytes except isopropylbenzene and methyl acetate. The maximum concentrations of analytes with supplemental ESVs were less than the supplemental ESVs. These analytes are not expected to pose a significant risk to ecological receptors.

#### Groundwater

In groundwater, ESVs were lacking for several detected inorganic constituents; however, these constituents were considered to be (1) consistent with background, (2) within the respective background range, or (3) a macronutrient. Consequently, none of these constituents are considered to pose significant risk.

## 7.5 Summary

Potential ecological risks at UXO-20 and Site 17 are considered to be low, and the resulting risk to ecological receptors is considered insignificant. Additional investigation of these sites is not recommended.

At Site 15, Aroclor-1254 and mercury in surface soil and 4,4'-DDE, 4,4'-DDT, antimony, lead, and zinc in subsurface soil were detected at elevated concentrations in one area (IR15-SS01). Because this area is not well characterized, additional investigation to delineate the nature and extent of inorganics, pesticides, and PCBs is recommended. Although inorganics in subsurface soil are not expected to pose significant risks to ecological receptors, further evaluation of inorganics in subsurface soil is recommended.

At Site 85, antimony, cadmium, copper, lead, manganese, mercury, thallium, and zinc in surface soil had high magnitudes of exceedance and were well outside the respective background ranges. Consequently, these inorganics are considered to pose potential risk to ecological receptors and additional evaluation is recommended.



# Conclusions and Recommendations

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This section presents the conclusions and recommendations based on the results of the investigative activities conducted during this PA/SI.

## 8.1 Conclusions

### 8.1.1 UXO-20

#### Surface and Subsurface Soil

Arsenic was the most prevalent metal detected in surface and subsurface soils across UXO-20, with concentrations exceeding regulatory criteria and twice the Base background concentration. No other analyzed metals were detected at concentrations exceeding regulatory screening criteria and twice the Base background.

#### Groundwater

Two metals, arsenic and lead, were detected at concentrations exceeding regulatory screening criteria and twice the Base background in groundwater samples collected at UXO-20.

#### HHRS and ERS

Initially, arsenic in groundwater was identified as a COPC in the HHRS. However, arsenic was detected in only 12 of 37 groundwater samples. Additionally, arsenic exceeded twice the mean background concentration (5.77 µg/L) in only 2 of 37 samples (9.4J µg/L and 6.1J µg/L). This suggests that the detected concentrations of arsenic in soil from UXO-20 likely associated with naturally occurring levels and not a result of former small arms range activities. Therefore, arsenic was eliminated as a COPC in the HHRS.

Based on the evaluation of available soil and groundwater data, results of the human health and ecological risk-based screenings indicate that exposure to soil and groundwater within UXO-20 would not result in any potentially unacceptable risks to human health or ecological receptors.

### 8.1.2 IR Site 15

#### Surface Soil

VOCs or SVOCs were not detected at concentrations exceeding regulatory criteria in surface soil samples collected at Site 15. One PCB, aroclor-1254, was detected above regulatory criteria at one surface soil sample location. One pesticide, dieldrin, was detected above regulatory criteria at two surface soil sample locations. Four metals were detected at concentrations exceeding regulatory criteria and twice the Base background in surface soil samples at IR 15, including aluminum, arsenic, chromium, and iron.



### Subsurface Soil

VOCs, SVOCs, or PCBs were not detected at concentrations exceeding regulatory criteria in subsurface soil samples collected at Site 15. One pesticide, dieldrin, was detected above regulatory criteria at one subsurface soil sample location. Five metals were detected at concentrations exceeding regulatory criteria and twice the Base background in subsurface soil samples, including arsenic, chromium, iron, lead, and manganese.

### Groundwater

VOCs, SVOCs, OCPs, or PCBs were not detected at concentrations exceeding regulatory criteria in groundwater samples collected at Site 15. Three metals were detected at concentrations exceeding regulatory criteria and twice the Base background in groundwater samples, including, chromium, iron, and manganese. Two dissolved metals, iron and manganese, were detected at concentrations exceeding regulatory criteria and twice the Base background.

### Test Pits

Eight test pits (IR15-TP01 through IR15-TP08) were excavated to depths ranging from 2 to 7 ft bgs to assess the boundaries of the former disposal area (**Figure 4-6**). Based on the observations made during the test pit excavations, the boundaries of the former disposal area appear to have been adequately delineated.

### HHRS and ERS

Based on the analytical data for surface and subsurface soil samples collected at Site 15, constituents detected do not present an unacceptable risk to human health. However, chromium was identified as a COPC in groundwater. Exposure to groundwater at Site 15 may present an unacceptable risk to human health and further assessment is recommended.

Based on the analytical data collected from Site 15, exposure to PCBs and metals in surface soil and pesticides in subsurface soils present a potentially unacceptable risk to ecological receptors and further assessment is recommended. No unacceptable risks to ecological receptors were identified in groundwater at Site 15.

## 8.1.3 IR Site 17

### Surface Soil

VOCs, SVOCs, OCPs, or PCBs were not detected at concentrations exceeding regulatory criteria in surface soil samples collected at Site 17. Three metals were detected at concentrations exceeding both twice the Base background and regulatory criteria in surface soil samples, including arsenic, chromium, and iron.

### Subsurface Soil

One VOC, 1,2-dibromo-3-chloropropane, was detected above regulatory criteria in one subsurface soil sample location at Site 17. No SVOCs, OCPs, or PCBs were detected above regulatory criteria in the subsurface soil samples. Four metals (aluminum, arsenic, chromium, and iron) were detected at concentrations exceeding regulatory criteria and twice the Base background in subsurface soil samples.



## Groundwater

One VOC, chloroform was detected at a concentration exceeding regulatory criteria in the groundwater samples collected at Site 17. No SVOCs, OCPs, or PCBs were detected in the groundwater samples at concentrations exceeding regulatory criteria. No metals were detected in the groundwater samples at concentrations exceeding both Base background and regulatory criteria.

## HHRS and ERS

Based on the evaluation of available soil and groundwater data, results of the human health and ecological risk-based screenings indicate that exposure to soil and groundwater within Site 17 would not result in any potentially unacceptable risks to human health or ecological receptors.

### 8.1.4 IR Site 85

#### Surface Soil

No VOCs, SVOCs, or PCBs were detected at concentrations exceeding regulatory criteria in surface soil samples collected at Site 85. One pesticide, dieldrin, was detected above regulatory criteria at two surface soil sample locations. Ten metals (antimony, arsenic, cadmium, chromium, iron, lead, manganese, mercury, thallium, and zinc) were detected at concentrations exceeding regulatory criteria and twice the Base background in surface soil samples.

#### Subsurface Soil

One VOC, 1,2-dibromo-3-chloropropane, was detected above regulatory criteria in one subsurface soil sample location at Site 85. No SVOCs, pesticides, or PCBs were detected above regulatory criteria in the subsurface soil samples. Two metals (aluminum and arsenic) were detected at concentrations exceeding regulatory criteria and Base background in subsurface soil samples.

## Groundwater

One VOC, methylene chloride, was detected in the groundwater samples collected at IR 85. No SVOCs, pesticides, or PCBs were detected in the groundwater samples at concentrations exceeding regulatory criteria. Three metals (aluminum, iron, and chromium) were detected in the groundwater samples collected at IR 85 at concentrations exceeding both Base background and regulatory criteria in the groundwater samples.

## Batteries

Lead and mercury were detected in the battery sample at concentrations exceeding the EPA maximum toxicity values. The batteries observed at Site 85 were removed during the test pit excavations.

## HHRS and ERS

Based on the analytical data collected at Site 85, exposure to groundwater may present an unacceptable risk to human health from chromium, based on the screening value for hexavalent chromium. Unacceptable human health risks were not identified for surface and subsurface soils.



Based on surface soil samples collected at Site 85, exposure to metals presents a potentially unacceptable risk to ecological receptors. Unacceptable risks to populations of ecological receptors were not identified from subsurface soil and groundwater.

## 8.2 Summary

Based on the analytical results for surface soil, subsurface soil, and groundwater samples collected from UXO-20 and the former IR Sites and the HRS and ERS summarized above, the following conclusions are made:

- No risks to human health or ecological receptors were identified at Site 17.
- No risks to human health or ecological receptors were identified at UXO-20 and no small arms-related items associated with the former ranges were found during the field investigation. The absence of contamination at UXO-20 suggests that it is unlikely that water bodies, including the New River, would be impacted as a result of the former small arms range activities.
- The presence of chromium in groundwater poses a potentially unacceptable risk to human health based on potable use of groundwater in the vicinity of Sites 15 and 85.
- The presence of metals, pesticides, and PCBs in soil poses a potentially unacceptable risk to ecological receptors in the vicinity of Site 15.
- The presence of metals in soil poses a potentially unacceptable risk to ecological receptors in the vicinity of Site 85.
- Debris remains in place within the boundaries of the Site 15 former disposal area and batteries may be present in the Site 85 vicinity.

## 8.3 Recommendations

Based on the conclusions summarized above, the following recommendations are made:

- Closeout and removal of UXO-20 from the MMRP based on the lack of contamination resulting from former small arms range activities.
- Collection of additional soil and groundwater samples from Site 15 and Site 85 based on the potentially unacceptable risks to human and ecological receptors. The additional investigations planned and presence of debris at Sites 15 and 85 should be considered during MILCON planning in these areas.



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## Appendix A

### Archival Records Search Report

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# **Archival Records Search Report Camp Johnson Construction Area**

**Marine Corps Base Camp Lejeune  
Jacksonville, North Carolina**

**Task Order 011**

**January 2009**

Prepared for

**Department of the Navy  
Naval Facilities Engineering Command  
Atlantic**

Under the

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Prepared by



**CH2MHILL**

**Charlotte, North Carolina**



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## Attachments

1	Resource Review Summary
2	Property Map for Area A - 1941
3	Small Arms Ammunition Data Sheets



# Acronyms and Abbreviations

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ASR	Archives Search Report
BAR	Browning automatic rifle
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CTO	Contract Task Order
CSI	Confirmatory Site Investigation
°F	degrees Fahrenheit
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ft	feet
IR	Installation Restoration
IRM	Interim Remedial Measures
MC	munitions constituents
MCCSSS	Marine Corps Combat Service Support Schools
MCB	Marine Corps Base
MEC	munitions and explosives of concern
MILCON	military construction
MOS	military occupation skills
MRP	Munitions Response Program
msl	mean sea level
NARA	National Archives and Records Administration
NAVFAC	Naval Facilities Engineering Command
NCGWQS	North Carolina Groundwater Quality Standards
NC Hwy	North Carolina Highway
NFA DD	No Further Action Decision Document
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
RCRA	Resource Conservation and Recovery Act of 1976
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SI	Site Inspection
SSL	Soil Screening Level
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit



TCRA	time critical removal action
US	United States
USACE	United States Army Corps of Engineers
UXO	unexploded ordnance
VOC	volatile organic compound
WWII	World War II



## SECTION 1

# Introduction, Purpose, and Scope

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The United States Marine Corps and the Naval Facilities Engineering Command (NAVFAC) are conducting an investigation of former ranges and Installation Restoration (IR) sites within the boundaries of a proposed military construction (MILCON) project in the area known as Camp Johnson at Marine Corps Base (MCB) Camp. The proposed MILCON area encompasses approximately 240 acres within Camp Johnson (**Figure A-1**). A munitions response program (MRP) Preliminary Assessment (PA)/Site Inspection (SI) is being conducted on a 35-acre area within the MILCON area within former range boundaries as shown in **Figure 1-1** in the *Site Specific Work Plan Addendum Preliminary Assessment/Site Inspection Camp Johnson MILCON Area* (CH2M HILL, 2009).

The results of the PA/SI will determine if any impacts to soil and groundwater have occurred at Camp Johnson due to past range activities. To support site investigation efforts, this archival records search report has been prepared to provide a narrative of the historical activities at Camp Johnson that may have resulted in environmental contamination with munitions and explosives of concern (MEC) or munitions constituents (MC).

The archival records search is an investigative review of existing information about the site and its surrounding area, with an emphasis on obtaining information from personnel and historical resources that might indicate a potentially hazardous release to the environment. The scope of this report includes:

- A review of existing information about the site (including MCB Camp Lejeune maps, drawings, and reports, and interviews with MCB Camp Lejeune personnel)
- Collection of additional information about the site

A complete listing of resources identified and investigated for this report is provided in **Attachment 1**. **Attachment 1** also includes details concerning the reviews of the historical information from the Marine Corps Library at Quantico, National Archives and Records Administration (NARA) map and text files, and MCB Camp Lejeune base files.



# Site Information

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## 2.1 Facility Information

MCB Camp Lejeune is located on the Atlantic coast in Jacksonville, North Carolina. The city of Jacksonville in Onslow County is the principal support community for the base. MCB Camp Lejeune occupies 153,000 acres including more than 450 miles of roads, approximately 6,800 buildings and facilities, and 14 miles of beach on the Atlantic Ocean for amphibious training. Approximately 14,000 acres of land have been developed for administrative, maintenance, logistics, and personnel support facilities. Originally established in 1941, the base is home to several tenant commands including II Marine Expeditionary Force, 2nd Marine Division, and 2nd Marine Logistics Group, two Navy commands, one Coast Guard command, and several Marine Corps formal schools. MCB Camp Lejeune supports a total population of approximately 150,000 people, including active-duty military and dependents, retirees, and civilian employees (Global Security, 2008).

### 2.1.1 Climate and Meteorology

The climate at MCB Camp Lejeune is characterized by mild winters and hot humid summers. Winters are usually short and mild with occasional and short-duration cold periods. Summers are long, hot, and humid. Average annual net precipitation is approximately 50 inches. Ambient air temperatures generally range from 33 to 53 degrees Fahrenheit (°F) in the winter months, and 71°F to 88°F during the summer months. Winds are generally south-southwesterly in the summer, and north-northwesterly in the winter (Water and Air Research, 1983). The hurricane season in the area surrounding MCB Camp Lejeune begins on June 1 and continues through November 30. Storms of nontropical origins such as frontal passages, local thunderstorms, and tornadoes are more frequent and can occur year-round.

### 2.1.2 Topography, Geology, and Hydrology

The land surface at MCB Camp Lejeune has been alternately exposed and submerged over time by water and marine deposits from an ancient inland sea. These deposits were laid down to form the weakly dissected alluvial plane. The deposits are mostly sands layered with clay and marine shells. Elevations range from sea level at the waterways to 72 feet (ft) above mean sea level (msl) between the New River and United States (U.S.) Route 17. MCB Camp Lejeune consists of both broad, level flatlands and gently rolling hills.

Southeastern North Carolina and MCB Camp Lejeune are within the Tidewater region of the Atlantic Coastal Plain Physiographic Province. The Tidewater region is generally swampy and of low relief, with elevations averaging about 20 ft above msl. The MCB Camp Lejeune area is underlain by an eastward thickening sediment wedge of marine and nonmarine origins ranging in age from early Cretaceous to Holocene. The eastward thickening wedge of sediment begins at the western boundary of Atlantic Coastal Plain



physiographic province, known as the Fall Line, and dips southeastward towards the coast. Along the coastline, several thousands of feet of interlayered, unconsolidated sediment are present consisting of gravel, sand, silt, clay deposits, calcareous clays, shell beds, sandstone, and limestone that were deposited over pre-Cretaceous crystalline basement rock. These sediment units are often distinguished by minor amounts of detrital carbonate shells and secondary minerals such as glauconite, siderite, and chlorite (Cardinell, Berg, and Lloyd, 1993).

Fluctuations in sea level on a subsiding continental margin in marine and near-shore environments are believed to have controlled Historical Coastal Plain sedimentation and deposition (Winner and Coble, 1989). Confining units associated with specific aquifers within the Coastal Plain region are composed of less-permeable beds of clay and silt. Within the MCB Camp Lejeune area, approximately 1,500 ft of a sedimentary sequence overlie the crystalline basement rock. This sedimentary sequence composes seven aquifers and their associated confining units including the Surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and Upper and Lower Cape Fear aquifers (Cardinell, Berg, and Lloyd, 1993).

Interstream areas generally provide the recharge of aquifers within the Coastal Plain region. Recharge to the aquifers has been estimated to have a yearly range of 5 to 21 inches of rainfall (Heath, 1989). In general, natural discharge of groundwater from the Coastal Plain aquifer system is into streams, swamps, and lakes. Evapotranspiration from the soil zone and upward leakage through confining units into streams, estuaries, swamps, and even the ocean also contribute to groundwater discharge. The New River estuary serves as the principal discharge area for groundwater from the Castle Hayne aquifer within the vicinity of MCB Camp Lejeune (Harned, Lloyd, and Treece, 1989).

## 2.2 Ownership and Operational History

### 2.2.1 Camp Lejeune Ownership History

The history of the land now occupied by Camp Lejeune is documented primarily through land records and maps. Following the start of World War II (WW II), the War Department began purchasing tracts of land in 1941 from local residents to meet the need for an East Coast amphibious training facility. Prior to occupation by the Marine Corps, the land had been occupied by white and African-American communities and farms since the Colonial era. The land contained plantation houses, cabins, farm buildings, tobacco barns, stores, and various cemeteries (Global Security Website, 2008).

The initial land transferred to the government was acquired in 14 different transactions between April and October 1941 and totaled 173.8 square miles or 111,155 acres, of which there were 85,155 land acres and about 26,000 acres under water (Loftfield, 1981; Louis Berger Group, 2002). The individual tracts of land were grouped into various “areas” for consolidation. The facility was initially referred to as the Marine Barracks New River, which was changed to MCB Camp Lejeune in 1942 (Global Security Website, 2008).

The Camp Johnson MILCON area is located within Area A, which is bounded to the north and northeast by North Carolina Highway 24 (NC Hwy 24), to the south and southeast by Northeast Creek, and to the west by New River. Area A consists of 65 tracts of land acquired by the government in 1941 by area landowners. The Camp Johnson MILCON area overlaps



two full parcels (A38 and A47) and partially overlaps four parcels (A14, A32, A41, and A44) as shown in the 1941 Property Map for Area A (Bureau of Yards and Docks, 1941) supplied as **Attachment 2**.

## 2.2.2 Camp Johnson Operational History

The Camp Johnson MILCON area is located off Montford Landing Road within the Camp Johnson area of the Base. The site is located on Montford Landing Road and is bounded by U.S. Highway 17 by-pass to the north, the New River to the west, Wilson Road and Coolidge Road to the southwest, and an unnamed road to the north. Camp Johnson, formerly named Montford Point Camp, was the original training center for African-American Marines during the period of military segregation. Between 1941 and 1949, approximately 20,000 African-American Marines were trained at Montford Point. In 1949, the military was fully integrated and the area continued to be used for schools and training. Montford Point was renamed Camp Johnson in 1974. Camp Johnson currently houses the Marine Corps Combat Service Support Schools (MCCSSS), which serve as training facilities for various duties within the Marine Corps. The MCCSSS consists of four military occupation skills (MOS) schools, four tenant schools, and the Navy's Field Medical School. Approximately 10,000 students per year are trained at Camp Johnson (MCB Camp Lejeune Website, 2008).

Portions of the MILCON area are composed of two former ranges: the 1,000-inch range and the A-1 50-ft .22 caliber range. In addition, the site encompasses IR Site 15 (Solid Waste Management Unit [SWMU] 46) the Montford Point Dump Site, IR Site 17 (SWMU 47) the Montford Point Rip-Rap area, and IR Site 85 (SWMU 241) the Camp Johnson Battery Dump. **Figure A-1** shows the former range and IR Site boundaries. Site histories and previous investigations are discussed below.

### Historical Site Use

A review of base maps showing existing conditions from 1945 to 2008 indicated that the Camp Johnson MILCON area has not contained any buildings with the exception of two pump houses and deep wells (M-243 and M-244) and tennis and racquetball courts, all of which first appear on the 1945 existing conditions map shown in **Figure A-2** (MCB Camp Lejeune, 1945). The pump houses and wells appear on all maps including 1979 but do not appear on the 2005 existing conditions map. Existing conditions maps from 1980 through 2004 are not available. The tennis and racquetball courts appear on all available existing conditions maps. In 1953, Hoover Road, on the east side of the Camp Johnson MILCON area, was extended toward Montford Landing Road, **Figure A-3**. Additionally, an unnamed road running perpendicular to Hoover Road appeared on the 1953 existing conditions map and all later maps.

The 1962 historical aerial (**Figure A-4**) shows the same roads appearing on the existing conditions maps as well as some additional small roads or paths that traverse the Camp Johnson MILCON area. The area is primarily wooded with a cleared area north of Coolidge Road and west of Wilson Road. A path running parallel to the unnamed road from **Figure A-3** corresponds to an obstacle course labeled S-M-257 on the 1964 existing conditions map (**Figure A-5**). A cleared area with no vegetation is shown south of the



unnamed road and Hoover Road intersection on the eastern side of the Camp Johnson MILCON area, which appears to correspond to IR Site 15, the Montford Point Dump Site.

Two additional pump houses (labeled as M-629 and M-630) appear on the 1979 existing conditions map along the obstacle course path (**Figure A-6**). The 1989 historical aerial photo (**Figure A-7**) shows the three roads that traverse the Camp Johnson MILCON area on the existing conditions maps (Hoover Road and the two unnamed roads perpendicular to it) as well as some additional small roads that are also found in **Figure A-1** and 2008 existing conditions (**Figure A-8**). The northern portion of the Camp Johnson MILCON area appears to be grassy rather than wooded like the majority of the MILCON area. There also appears to be a small cleared area with no vegetation in the northwest area between the two unnamed roads, which does not correspond with any known uses of the area.

## Historical Range Review

A review of historical range overlay maps (Plates 1-22) from the *Draft Range Identification and Preliminary Range Assessment* (USACE, 2000) indicated that two ranges intersected the Camp Johnson MILCON Area that will be investigated in the PA/SI. The first range to appear in the Camp Johnson MILCON Area was the 1,000-Inch Range at Montford Point (1946, Plate 4) and identified in the *Final Archives Search Report: Range Identification and Preliminary Range Assessment* (USACE, 2001) as Archives Search Report (ASR) number 2.32. The A-1 50-ft .22 Caliber Range (ASR 2.87) appears in different locations (as shown on **Figure A-1**) on the following Plates: Plate 5 (1951), Plate 6 (1953), and Plate 8 (1954). The boundaries for these ranges are based on the range overlay maps (provided as **Figure A-9** for the 1,000-inch Range and **Figure A-10** for the A-1 50-ft .22 Caliber Range).

### 1,000-inch Range at Montford Point (ASR 2.32)

The 1,000-inch Range at Montford Point operated from 1946 to the mid-1950s. Camp Training Order Number 5-1946 identified this range as a Familiarization Range for .30 Cal Browning automatic rifle (BAR) (USACE, 2000). The range was used for small arms (Rifles from the M1 up to the BAR) (Richardson, 2008). The 1,000-inch Range appears on one range overlay map that indicates the firing position and direction of fire but does not give a fan or area that may be impacted by this range (**Figure A-9**). Due to the nature of small arms, unexploded ordnance (UXO) is not likely to be encountered; however, lead contamination in the impact berm may be present (Richardson, 2008).

### A-1 50-ft .22 Caliber Range (ASR 2.87)

The Former A-1 .22 Caliber Range appears on three range overlay maps in 1951, 1953, and 1954 (**Figure A-10**). The shape and location of the range varies slightly and it is in a similar location as the 1,000-inch Range. The range was used as a small-arms firing range during the 1950s and is believed to have been inactive since 1957 (USACE, 2000). The name of the range suggests that .22 caliber weapons were used; however, available documentation does not specify the type of small arms. An excerpt on small-arms ammunition (USACE, 2000) is provided in **Attachment 3**. UXO is not likely to be encountered but lead contamination may be present in the impact berms (Richardson, 2008).



## Previous Environmental Investigations

In addition to the two historical ranges in the Camp Johnson MILCON area, there are three IR Sites (15, 17, and 85) that have undergone environmental investigations. Figures and a more detailed history of each of these sites may also be found in the *Site Specific Work Plan Addendum, Preliminary Assessment/Site Inspection, Camp Johnson MILCON Area* (CH2M HILL, 2009).

### Site 15 (SWMU 46)

Site 15, also known as SWMU 46, is the former Montford Point Dump. The site operated between 1946 and 1958 and was reportedly used to dispose sewage treatment sludge, litter, asphalt, and sand (CH2M HILL/Baker, 2005). The disposal area is approximately 2 acres and consists of open areas surrounded by vegetation.

The Final Resource Conservation and Recovery Act of 1996 (RCRA) Facility Assessment (RFA) for Camp Lejeune (EnSafe, 1996) identified No Further Action was warranted at Site 15/SWMU 46. However, Baker conducted a Confirmatory Site Investigation (CSI) in 1997 and a Phase II CSI in 2002 at the site after it became evident that additional waste had been disposed at the site. The investigations included a geophysical survey to identify the location of the buried waste as well as soil and groundwater sampling. The results of the investigations indicated several metals were present in soils across the site. Lead was detected in one groundwater sample at a concentration above base background criteria and North Carolina Groundwater Quality Standards (NCGWQS). In addition, the geophysical survey indicated a significant anomaly consistent with a small landfill near the central portion of the investigation area. The boundaries of the landfill were not determined during the field events due to limitations to the geophysical survey (Baker, 2001 and Baker, 2002).

In 2004, Baker conducted a RCRA Facility Investigation (RFI) to further identify the waste locations and evaluate potential contamination. The RFI consisted of additional geophysical testing, test trenches, surface and subsurface soil samples, and sampling of one groundwater monitoring well. The trenches exposed landfill material such as glass, metal debris, ceramic, ash, and other burned debris (CH2M HILL and Baker, 2005).

The RFI concluded that surface soil had high metals content, particularly in soil mounds located in the southeast portion of the site. In addition, subsurface soil within the landfill trenches exhibited elevated concentrations of metals, semivolatile organic compounds (SVOCs), and pesticides with some contaminants exceeding regulatory criteria. Pesticide concentrations measured in subsurface soil samples collected from the landfill exceeded the base background levels, indicating the concentrations could be attributed to past disposal activities and not basewide pesticide use. One monitoring well was installed as part of the RFI. No metal constituents were detected in the groundwater sample collected from the well; therefore, no additional monitoring wells were installed. It was recommended that surface mounds and contaminated surface soil should be managed as RCRA waste, and the landfill waste within the disposal site should be managed as Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) waste as part of IR Site 15 (CH2M HILL and Baker, 2005).

In 2006, CH2M HILL conducted soil mound and surface soil sampling to analyze for volatile organic compounds (VOCs), SVOCs, pesticides, polychlorinated biphenyls (PCBs), and



RCRA metals. VOCs, SVOCs, and PCBs were either not detected or concentrations were lower than the screening criteria (North Carolina Soil Screening Levels [SSLs], United States Environmental Protection Agency [EPA] Region IX industrial preliminary remediation goals [PRGs], and base background for metals). Surface soil and mounds with pesticides and metals that exceeded screening criteria were identified for removal (CH2M HILL, 2006). An Interim Remedial Measures (IRM) implementation was completed in March 2007 at which time three soil mounds and five designated surface soil areas were excavated (Shaw, 2007). A total of 1,039 tons of soil were removed from the site and disposed at the MCB Camp Lejeune landfill.

Buried landfill debris and contaminated soil remain in the subsurface. The debris area has been delineated, although the waste depth is only estimated. Groundwater has not been fully characterized. Because of the high concentrations of pesticides in the subsurface soil, it is anticipated that pesticides may also be present in groundwater.

#### Site 17 (SWMU 47)

Site 17, also known as SWMU 47, contains inert concrete rip-rap along the shoreline of Montford Point. The site was originally evaluated during the Initial Assessment Study (Water and Air Research, 1983) at the Base. During the initial assessment, it was determined that the inert nature of the concrete found at Site 17 did not require further investigation.

#### Site 85 (SWMU 241)

Site 85, the Camp Johnson Battery Dump, encompasses approximately 4.5 acres in the Camp Johnson support operations area of the Base. Site 85 was used as a battery dump during the 1950s. In 1992, decomposed batteries, which were used in military communication equipment during the Korean era, were unearthed as a roadway was being widened. Military personnel using this area also discovered discarded charcoal canisters from old air purifying respirators. The discarded battery packs and charcoal canisters were observed in piles, randomly located throughout a 2-acre to 3-acre area (Baker, 1998).

A Pre-RI screening study was conducted at Site 85 from 1995 to 1998. Field activities included soil and groundwater sampling for metals. Analytical results indicated that soil near the battery disposal piles was contaminated by metals leaching from the batteries. A baseline risk assessment, completed as part of the Pre-RI, identified potential risks to current military personnel due to exposure to metals in surface soil. Potential risks to future child and adult residents were also identified due to exposure to surface soil and groundwater. As a result of the findings in the Pre-RI, it was recommended that an Engineering Evaluation/Cost Analysis (EE/CA) be completed to evaluate remedial alternatives for soil contamination at the site (Baker, 1998).

The EE/CA recommended removal of the soil and battery packs through a time critical removal action (TCRA) followed by re-evaluation of site groundwater. The TCRA was completed from October to December 1999, and included the excavation and removal of 158 tons of contaminated soil and debris (OHM, 2000).



## SECTION 3

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#### Legend

- Former Ranges
- Camp Johnson Area
- IR Sites
- Installation Boundary

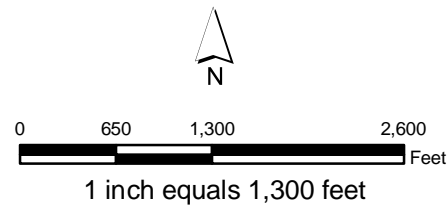
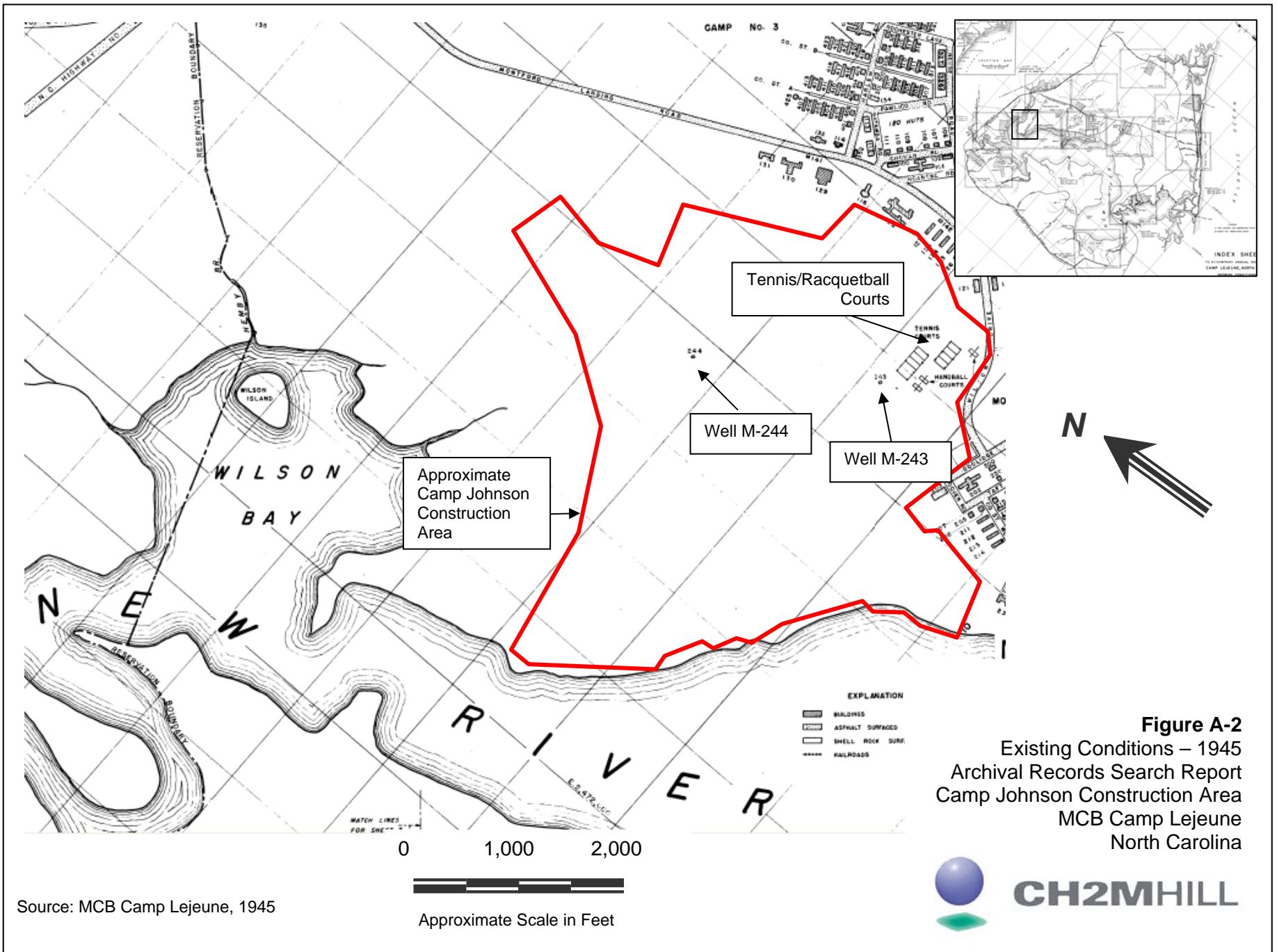
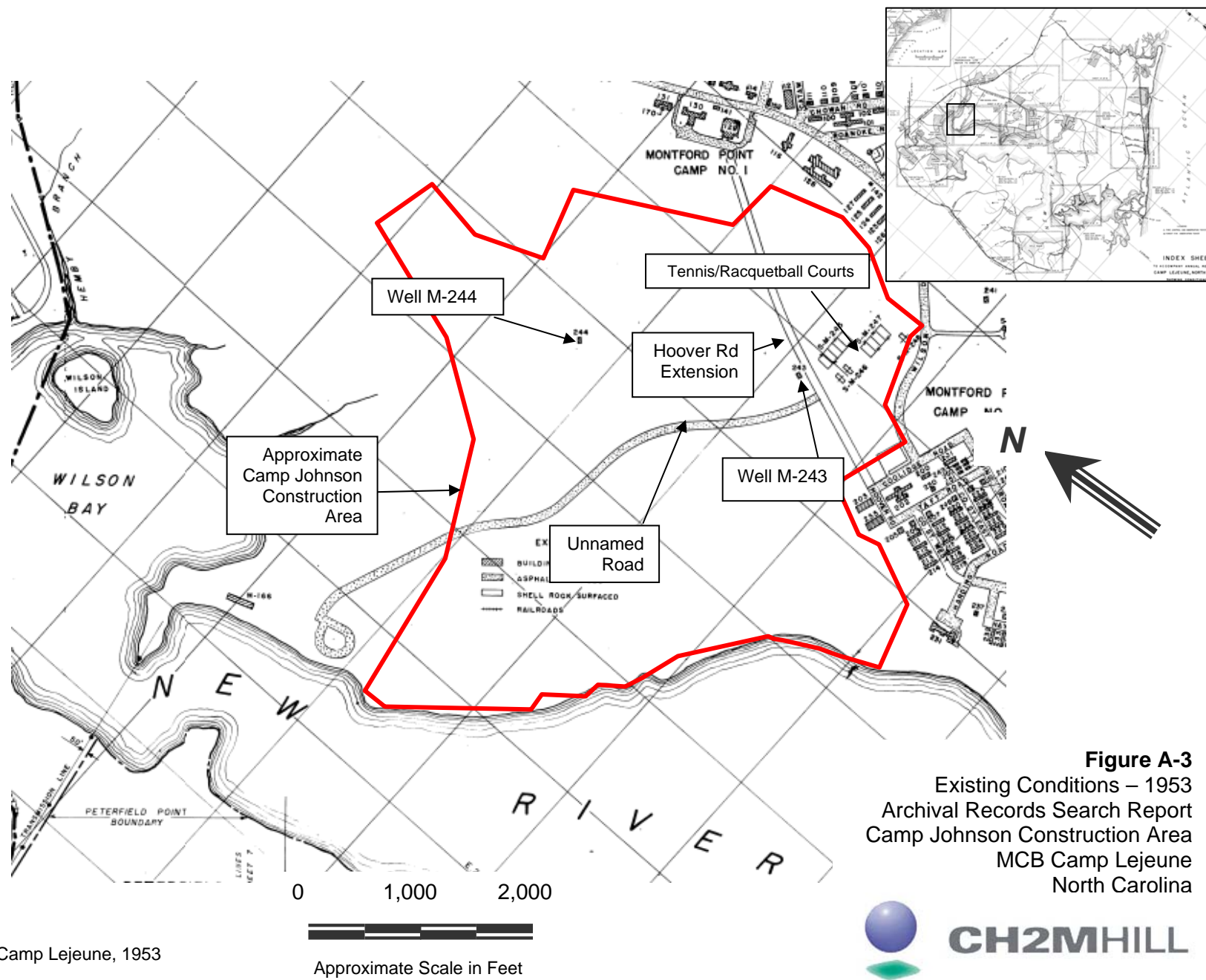


Figure A-1  
Former Ranges and IR Site Boundaries  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina

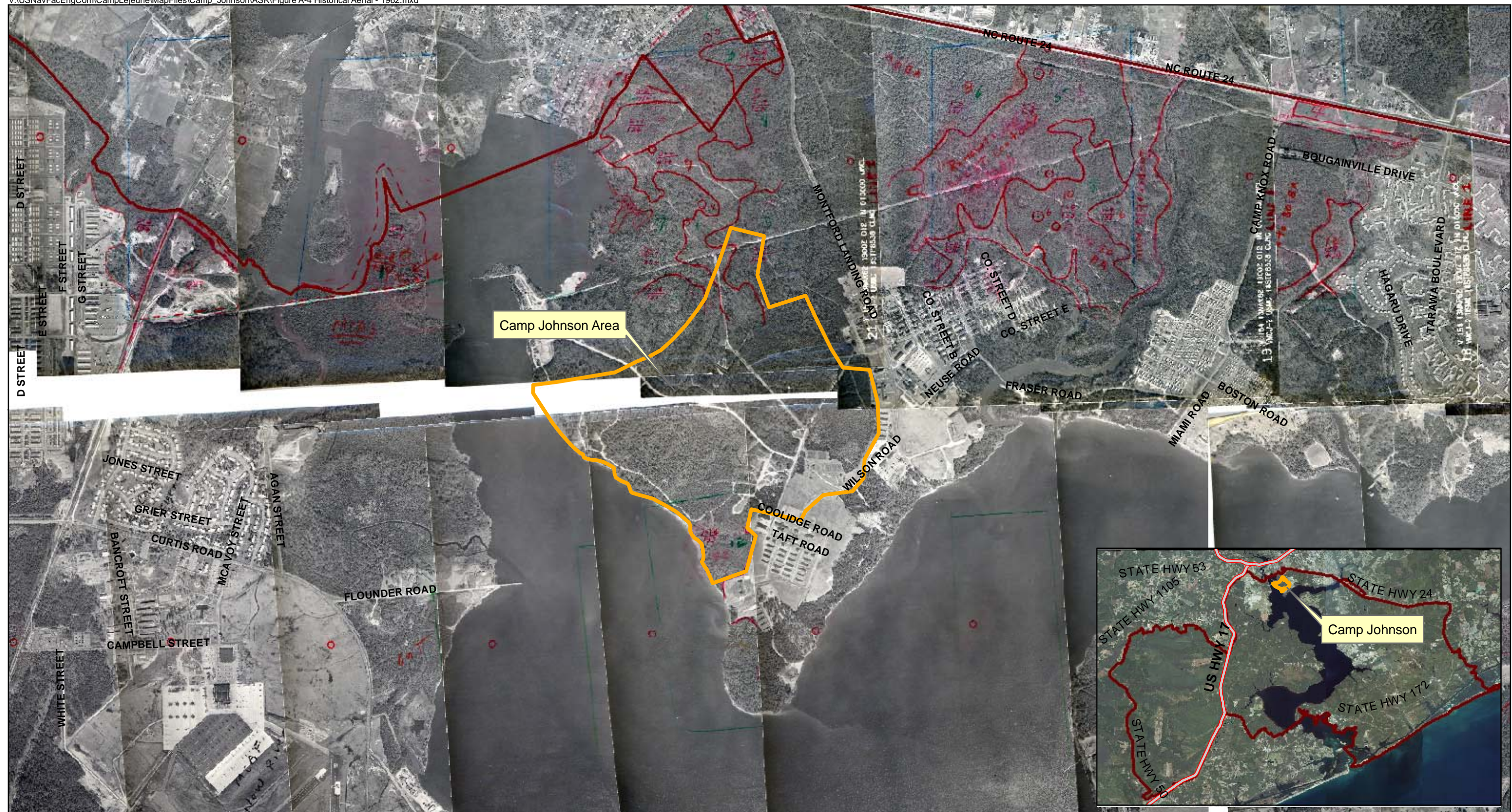












**Legend**  
Camp Johnson Area  
Installation Boundary

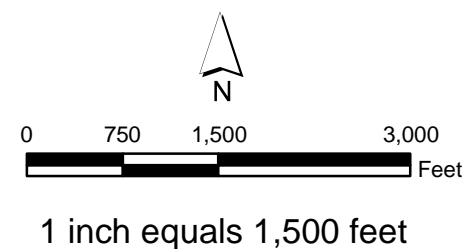
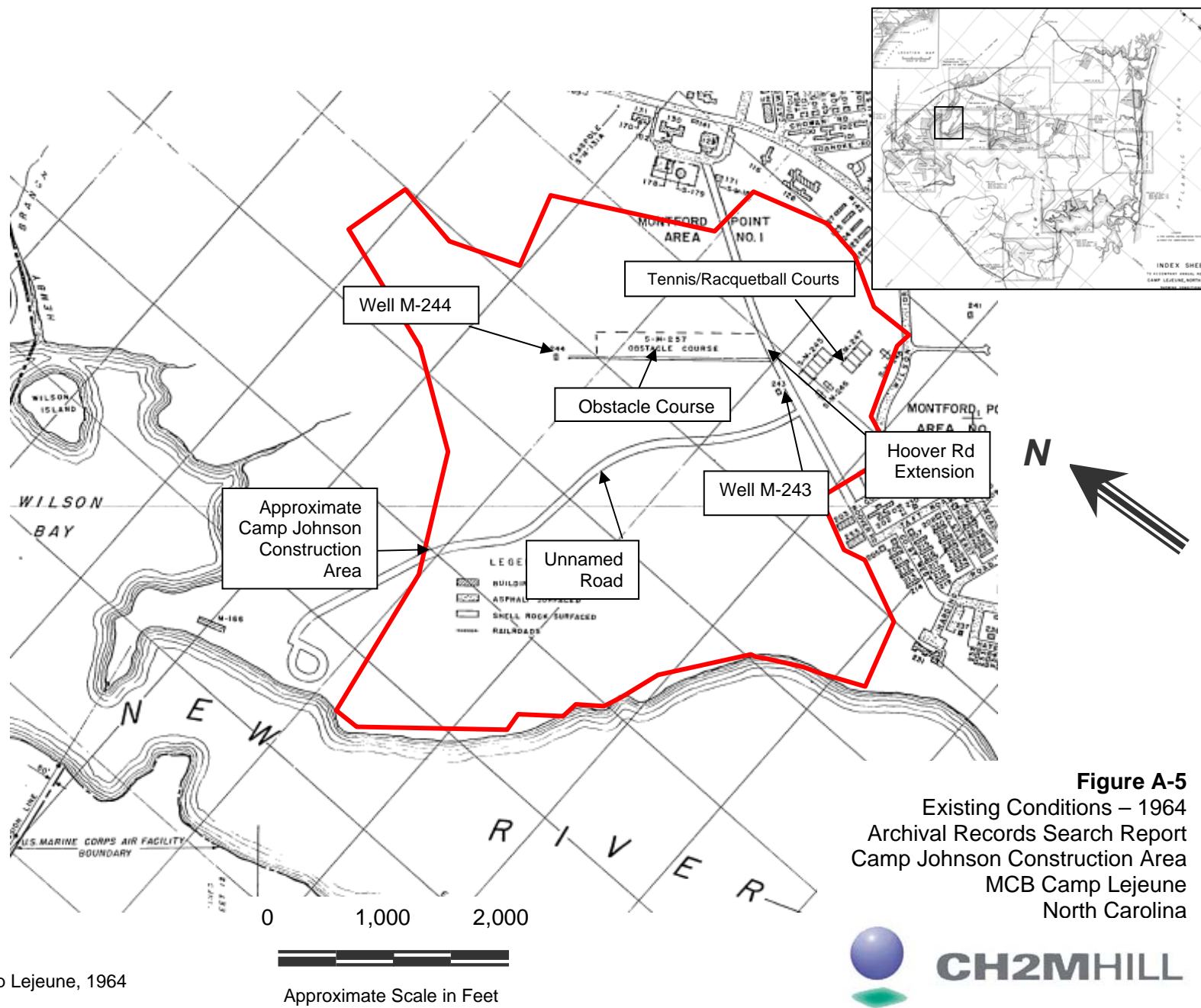


Figure A-4  
Historical Aerial - 1962  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina

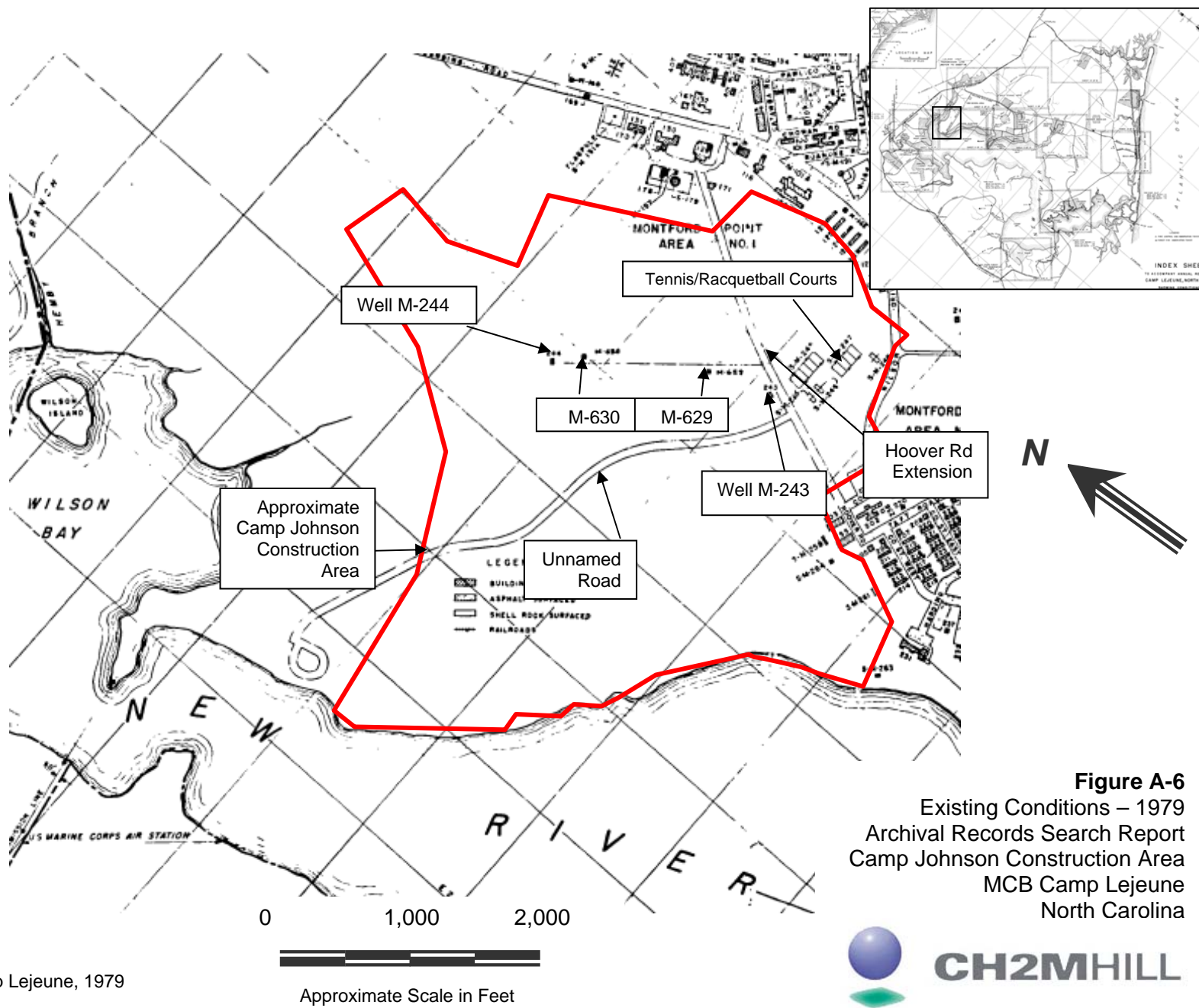




**Figure A-5**  
Existing Conditions – 1964  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina

Source: MCB Camp Lejeune, 1964









- Legend**
- Camp Johnson Area
  - Installation Boundary

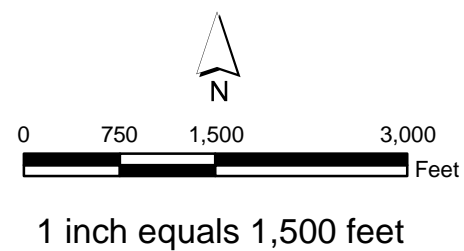
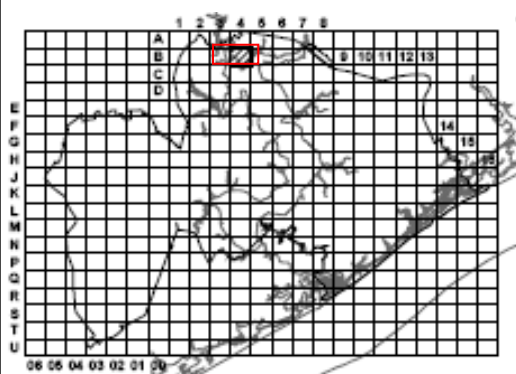
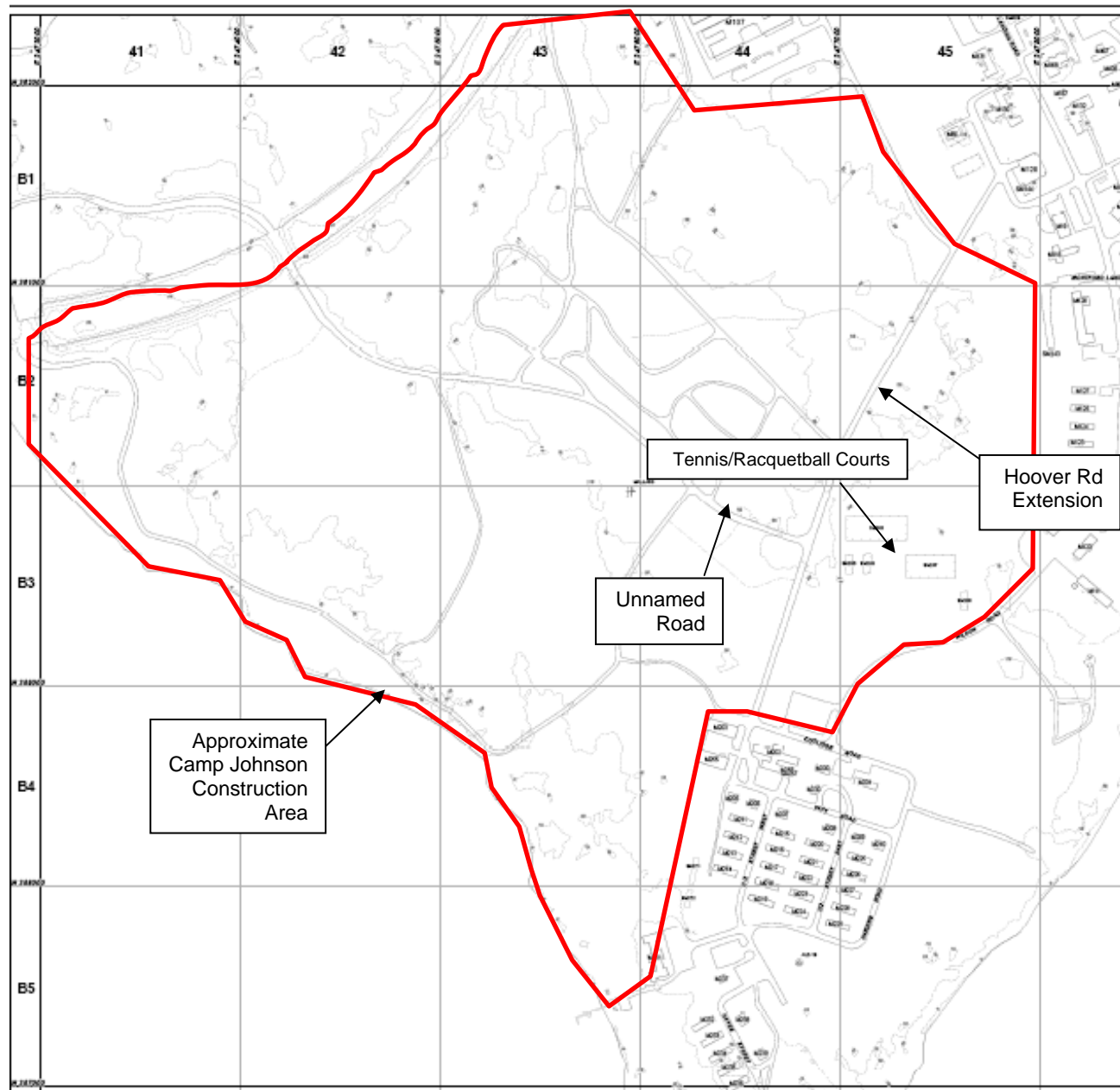


Figure A-7  
Historical Aerial - 1989  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina





0 1000 2000

Approximate Scale in Feet



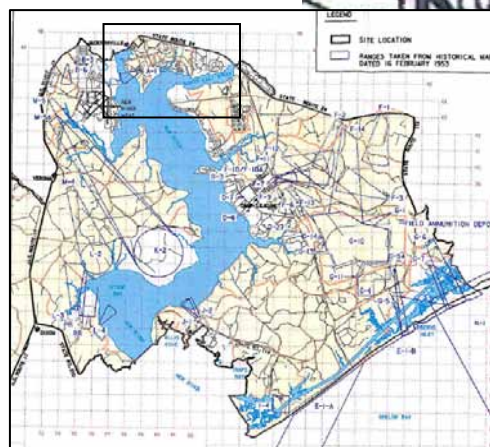
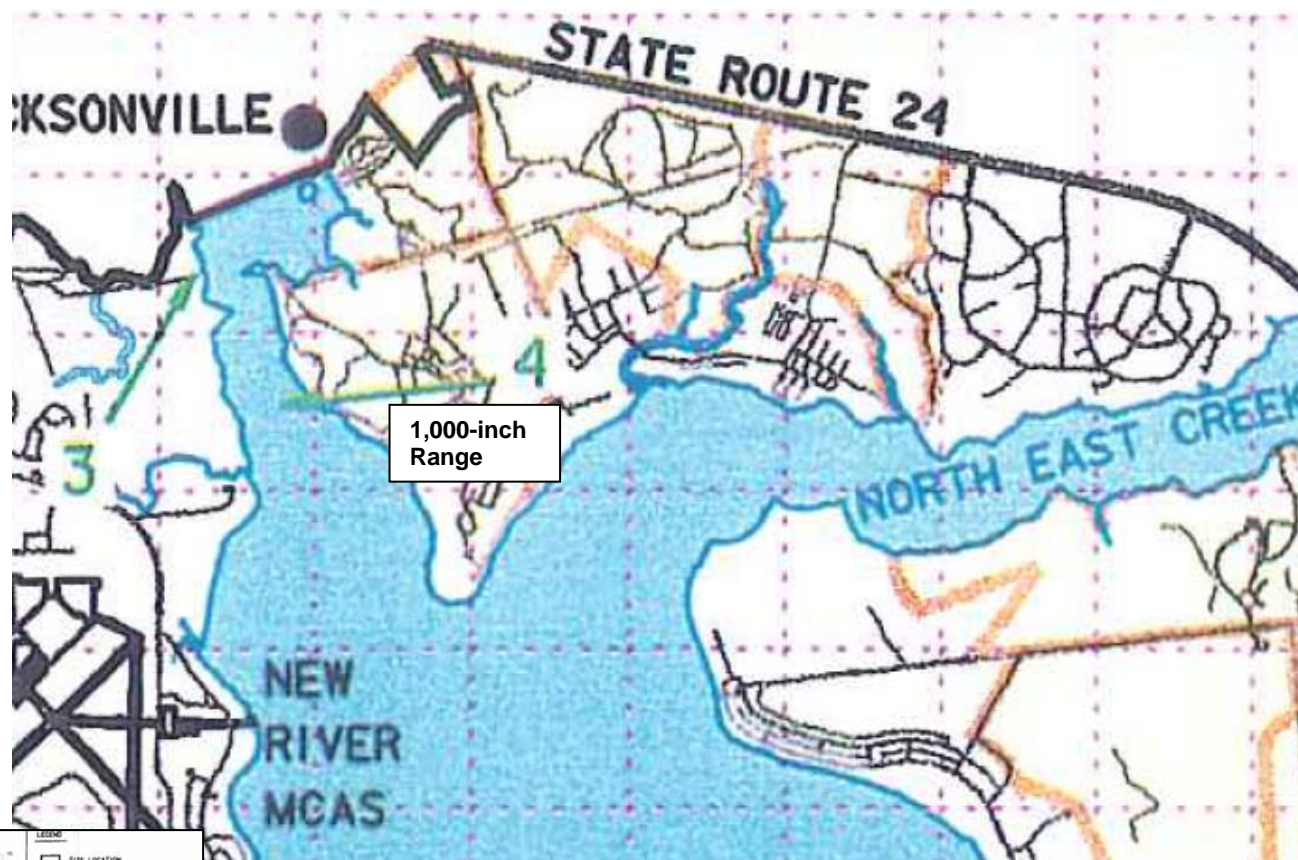
**CH2MHILL**

**Figure A-8**

Existing Conditions – 2008  
 Archival Records Search Report  
 Camp Johnson Construction Area  
 MCB Camp Lejeune  
 North Carolina

Source: MCB Camp Lejeune, 2008





0 2000 4000



Approximate Scale in Meters



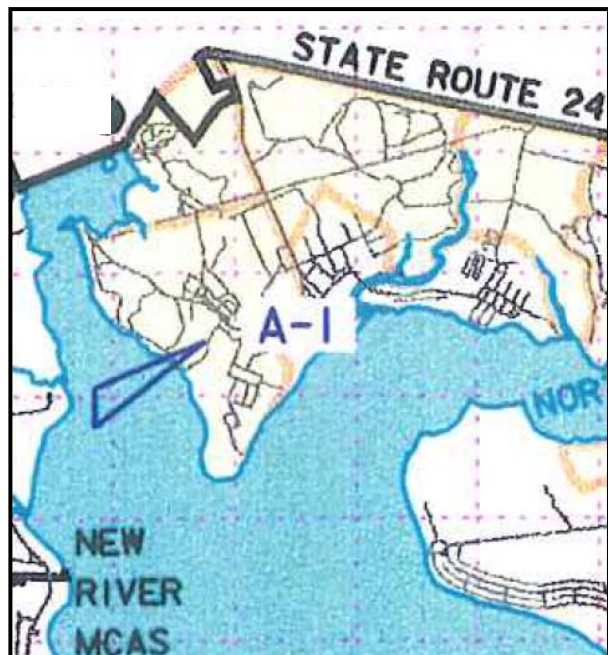
Source: USACE, 2000

**Figure A-9**  
Range Overlay Map - 1946  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina

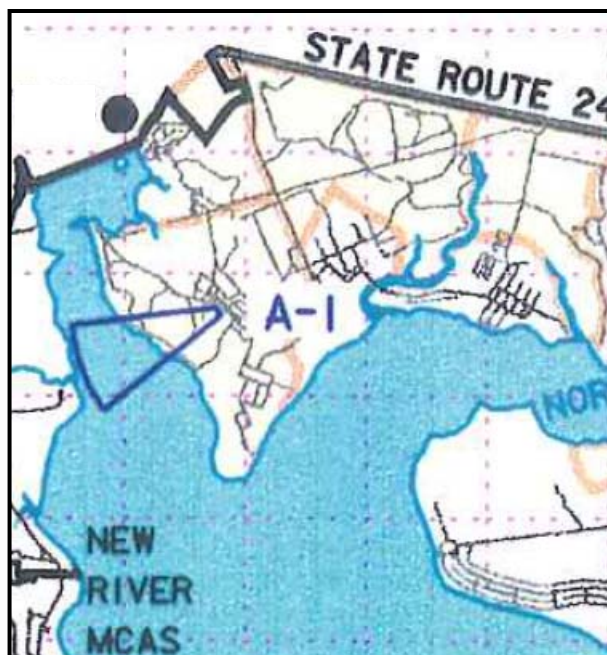


**CH2MHILL**

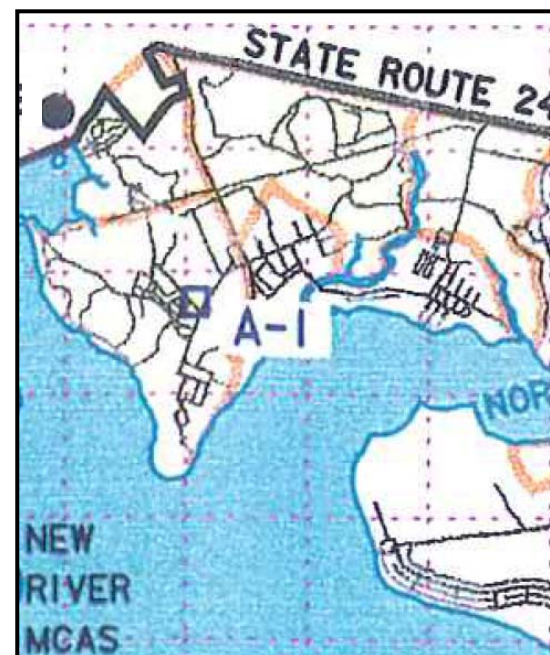




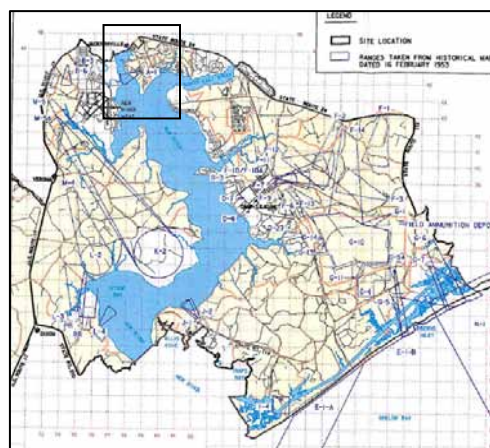
1951



1953



1954



Source: USACE, 2000



Approximate Scale in Meters



**Figure A-10**  
Range Overlay Maps – 1951, 1953, 1954  
Archival Records Search Report  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina



**CH2MHILL**



Attachment 1  
Resource Review Summary

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# Resource Review Summary

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The following table provides a summary of the specific references identified for review, interview, or contact for the archival report.

Resource	Actions Completed
Quantico, Virginia, Marine Corps Library, Gray Research Center	Reviewed all available file folders related to Camp Lejeune – Made copies of relevant historic maps. No files to copy.
US National Archives (NARA II) Historical Files	Reviewed text and drawing files from Text and Cartographic Divisions. Made copies of relevant files and maps.
Deborah Edge/National Archives Text File	See US National Archives Files Review
Camp Lejeune Technical Records files	Reviewed and copied all relevant documents related to historical land use for each site.
<b>Camp Lejeune Personnel</b>	
Linda Futrell/ Realty Specialist	Contacted and interviewed
Dennis Dunham/ Technical Records	Contacted and interviewed
Duane Richardson/ Base Range Safety Officer	Contacted and interviewed

## Marine Corp Library Review

### Text Division

Contact: Gregory Cina

Site Visit: October 7, 2008

File review at Marine Corps Base, Quantico, Virginia, Gray Research Center, Marine Corps Archives and Special Collections.

Several historic maps were digitally copied; however, no pertinent text documents were obtained from the file review.

### List of Documents Obtained from Marine Corp Library

- “Camp Lejeune, New River, North Carolina,” August 1943.
- “Combat Training Chart, United States East Coast, North Carolina, Approaches to New River,” December 26, 1987.
- “New River,” 1972.
- “Jacksonville South Quadrangle,” NW/4 New River 15’ Quadrangle, USGS, 1952.
- “North Carolina, Approaches to New River,” November 1950.



# National Archives and Records Administration Review

## Text Division

Contact: Ms. Deborah Edge, 301-837-1687

Site visits on September 15 - 18, 2008

Reviewed 12 boxes of files associated with the Marine Corps, 1939-1950

- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 1275/70-800 (10/45-1/47) to 1275/70-727 (1/44-12/47), Box 218.
- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 1275/70-800 (10/44-1/45) to 1275/70-800 (7/45-9/45), Box 219.
- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 1275/70-800 (10/44-1/45) to 1275/70-800 (7/45-9/45), Box 220.
- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 2295-10 Brooklyn to 2285-10 Camp Lejeune, Box 1570.
- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 2295-10 Camp Lejeune to 2285-10 Camp Lejeune, Box 1571.
- Record Group 127 (USMC), Office of the Commandant, General Correspondence, January 1939-June 1950, 2295-10 Camp Lejeune to 2285-10 Camp Lejeune, Box 1572.
- Record Group 127 (USMC), Quartermaster, General Correspondence, January 1940, 215-3, Box 144.
- Record Group 127 (USMC), Quartermaster, General Correspondence, January 1940, 215-3, Box 145.
- Record Group 127 (USMC), Quartermaster, General Correspondence, January 1940, 215-3, Box 146.
- Record Group 127 (USMC), Quartermaster, General Correspondence, January 1940, 215-3, Box 147.
- Record Group 127 (USMC), Quartermaster, General Correspondence, January 1940, 215-3, Box 148.
- Record Group 127 (USMC), Records of the USMC, Division of Public Information, General Correspondence, 1942- 1950, Box 1 of 1.

The boxes contained information primarily related to basic activities and events occurring at Camp Lejeune, as well as general ordnance orders and supply issues. Several historic maps were found showing the French Creek area.



## List of Documents Obtained from National Archives

- "Camp Lejeune General Area Map," February 12, 1942.
- "Camp Lejeune General Area Map," March 11, 1947.
- "Danger Zones in Navigable Waters," Document, June 3, 1947
- "Index Sheet to Accompany Annual Report Maps, Camp Lejeune, North Carolina," June 30, 1947.
- "Montford Point Camp and Vicinity Map," June 30, 1947.
- "Training Facilities, Regulations Governing Use of." Document, March 6, 1946.
- "Training Facilities, Regulations Governing Use of." Document, March 6, 1947.

## MCB Camp Lejeune Base Site Visit and Records Review

Base Contact: Ms. Linda Futrell, Public Works Division, 910-451-2818 x3257

File reviews of records in the base Technical Records office were conducted during the site visit. Additionally, interviews were conducted with Dennis Dunham/Technical Records, and Duane Richardson/EOD Base Range Safety Officer.

## List of Documents Obtained from Camp Lejeune

### Base Real Estate Office

- "Montford Point Camp and Vicinity," June 30, 1943.
- "Montford Point Camp and Vicinity," June 30, 1945.
- "Montford Point Camp and Vicinity," June 30, 1949.
- "Montford Point Camp and Vicinity," June 30, 1952.
- "Montford Point Camp and Vicinity," June 30, 1956.
- "Montford Point Camp and Vicinity," June 30, 1963.
- "Montford Point and Camp Knox Areas," July 31, 1984.
- "Montford Point Area," July 31, 1984.
- "Montford Point Area," 1985.
- "Existing Conditions Map," Grid A4, December 17, 2004.
- "Existing Conditions Map," Grid A4, August 29, 2008.
- "Existing Conditions Map," Grid A5, December 17, 2004.
- "Existing Conditions Map," Grid A5, August 29, 2008.
- "Existing Conditions Map," Grid B3, December 17, 2004.



- “Existing Conditions Map,” Grid B3, August 29, 2008.
- “Existing Conditions Map,” Grid B4, December 17, 2004.
- “Existing Conditions Map,” Grid B4, August 29, 2008.
- “Existing Conditions Map,” Grid B5, December 17, 2004.
- “Existing Conditions Map,” Grid B5, August 29, 2008.

#### Base Library

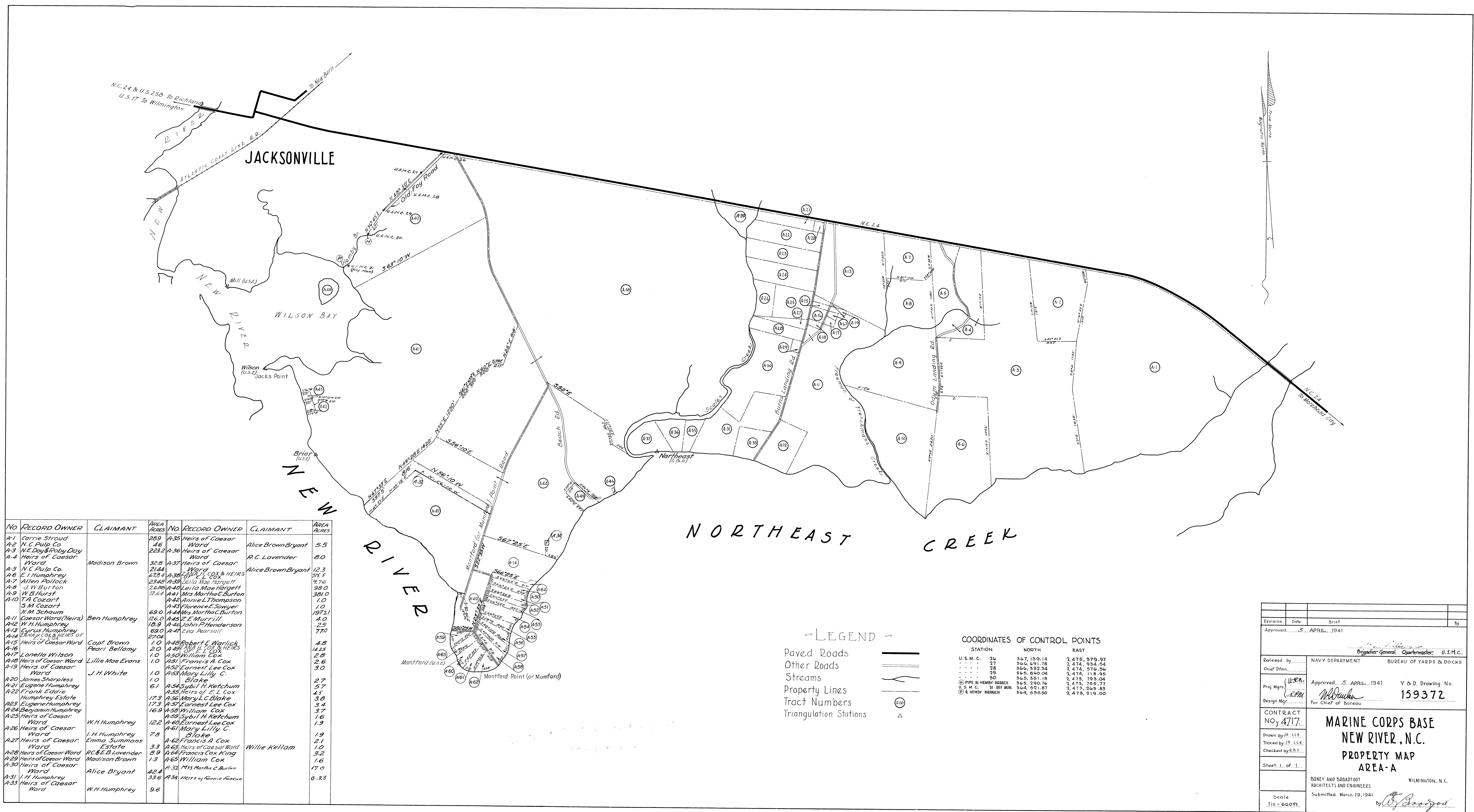
- Louis Berger Group, Inc. Under USCOE, Wilmington District Contract DACWS4-99-C-0004, *Semper Fidelis: A Brief History of Onslow County, North Carolina and MCB, Camp Lejeune*, 2002, United States Marine Corps, Lt. Col Lynn J. Kimball (USMC, Retired) Consulting Historian.
- Lotfield, Thomas, C. Principal Investigator. UNCW, August 1981. *Archeological and Historical Survey of USMC Base, Camp Lejeune; Naval Facilities Engineering Command Norfolk, Coastal Zone Resource Corp., Vol. II, Contract No. N62470-79-C-4273.*



Attachment 2  
Property Map for Area A – 1941

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NO	RECORD OWNER	CLAIMANT	AREA ACRES	NO	RECORD OWNER	CLAIMANT	AREA ACRES
A-1	Carrie Stroud		269	A-35	Heirs of Caesar	Alice Brown Bryant	5.5
A-2	N. C. Pulp Co.		46	A-36	Ward	R.C. Lavender	8.0
A-3	N.E. Day & Roby Day		223.2	A-37	Heirs of Caesar	Alice Brown Bryant	12.3
A-4	Heirs of Caesar	Madison Brown	32.8	A-38	Ward		715.5
A-5	N. C. Pulp Co.		2144	A-39	Ward		9.76
A-6	E. I. Humphrey		678.4	A-40	Ward		98.0
A-7	Allen Pollock		234.9	A-41	Ward		381.0
A-8	J. W. Burton		12.64	A-42	Ward		1.0
A-9	W.B. Hurst		12.64	A-43	Ward		1.0
A-10	T.A. Cozart		69.0	A-44	Ward		197.1
A-11	W.M. Schaum		126.0	A-45	Ward		4.0
A-12	Caesar Ward (Heirs)	Ben Humphrey	18.9	A-46	Ward		2.5
A-13	W.H. Humphrey		69.0	A-47	Ward		77.0
A-14	Cyrus Humphrey		270.4	A-48	Ward		4.8
A-15	Heirs of Caesar Ward	Capt. Brown	1.0	A-49	Ward		14.25
A-16	Heirs of Caesar Ward	Pearl Bellamy	2.0	A-50	Ward		2.8
A-17	Lanella Wilson		1.0	A-51	Ward		2.6
A-18	Heirs of Caesar Ward	Lillie Mae Evans	1.0	A-52	Ward		3.0
A-19	Heirs of Caesar		1.0	A-53	Ward		2.7
A-20	James Sharpless	J.H. White	6.1	A-54	Ward		5.7
A-21	Eugene Humphrey		17.3	A-55	Ward		4.3
A-22	Frank Estelle		17.3	A-56	Ward		3.4
A-23	Humphrey Estate		16.9	A-57	Ward		3.7
A-24	Eugene Humphrey		12.2	A-58	Ward		1.6
A-25	Benjamin Humphrey		7.8	A-59	Ward		1.9
A-26	Heirs of Caesar	W.H. Humphrey	3.3	A-60	Ward		2.1
A-27	Ward	I.H. Humphrey	8.9	A-61	Ward		3.2
A-28	Heirs of Caesar	Emma Simmons	1.3	A-62	Ward		1.6
A-29	Heirs of Caesar Ward	R.C. & B. Lavender	4.4	A-63	Ward		17.0
A-30	Heirs of Caesar	Madison Brown	4.4	A-64	Ward		0.23
A-31	Heirs of Caesar	Alice Bryant	9.6	A-65	Ward		
A-32	Heirs of Caesar	W.H. Humphrey					

LEGEND

- Paved Roads
- Other Roads
- Streams
- Property Lines
- Tract Numbers
- Triangulation Stations

COORDINATES OF CONTROL POINTS

STATION	NORTH	EAST
U.S.M.C. 26	367, 139.14	2, 475, 379.97
U.S.M.C. 27	366, 691.78	2, 474, 934.54
U.S.M.C. 28	366, 332.34	2, 474, 576.56
U.S.M.C. 29	366, 860.04	2, 474, 118.95
U.S.M.C. 30	365, 351.18	2, 475, 793.04
U.S.M.C. 31	365, 290.76	2, 475, 755.77
U.S.M.C. 32	364, 521.87	2, 475, 263.85
U.S.M.C. 33	364, 555.50	2, 475, 219.00

Revision	Date	Brief	By
Approved: 5 APRIL 1941			
Brigadier General, Quartermaster, U.S.M.C.			
Reviewed by	NAVY DEPARTMENT BUREAU OF YARDS & DOCKS		
Chief Draftsman	Approved: 5 APRIL 1941 Y & D Drawing No. 159372		
Proj. Mgr.	For Chief of Bureau		
Design Mgr.	CONTRACT NO. 4717		
MARINE CORPS BASE NEW RIVER, N.C. PROPERTY MAP AREA-A			
BONEY AND SHADDOFT ARCHITECTS AND ENGINEERS WILMINGTON, N.C.			
Submitted March 29, 1941			
Scale 1 in = 660 ft.			



Attachment 3  
Small Arms Ammunition Data Sheets

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# SMALL-ARMS AMMUNITION

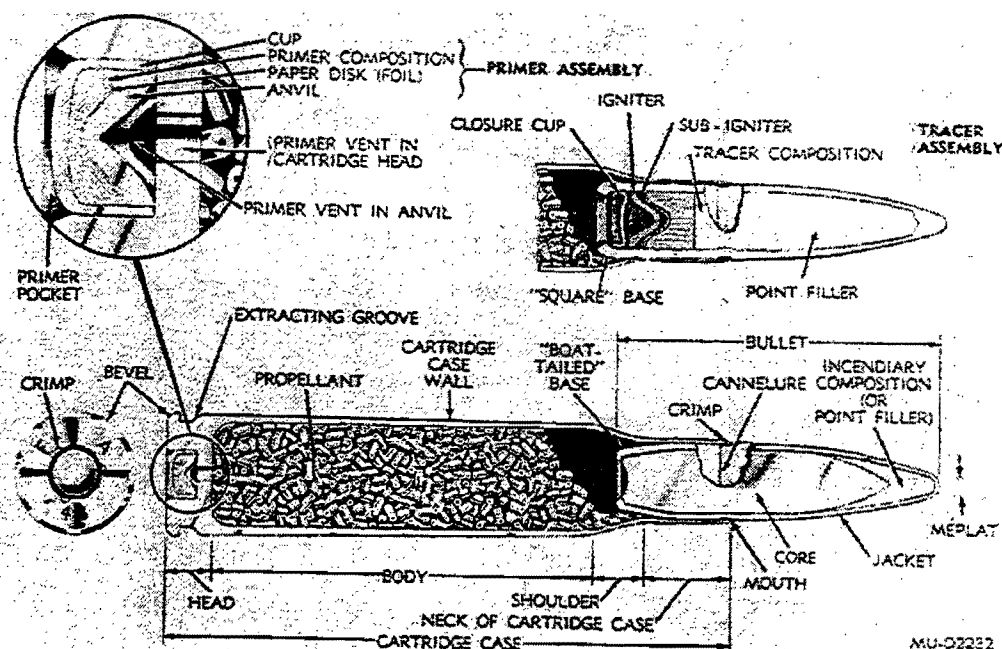


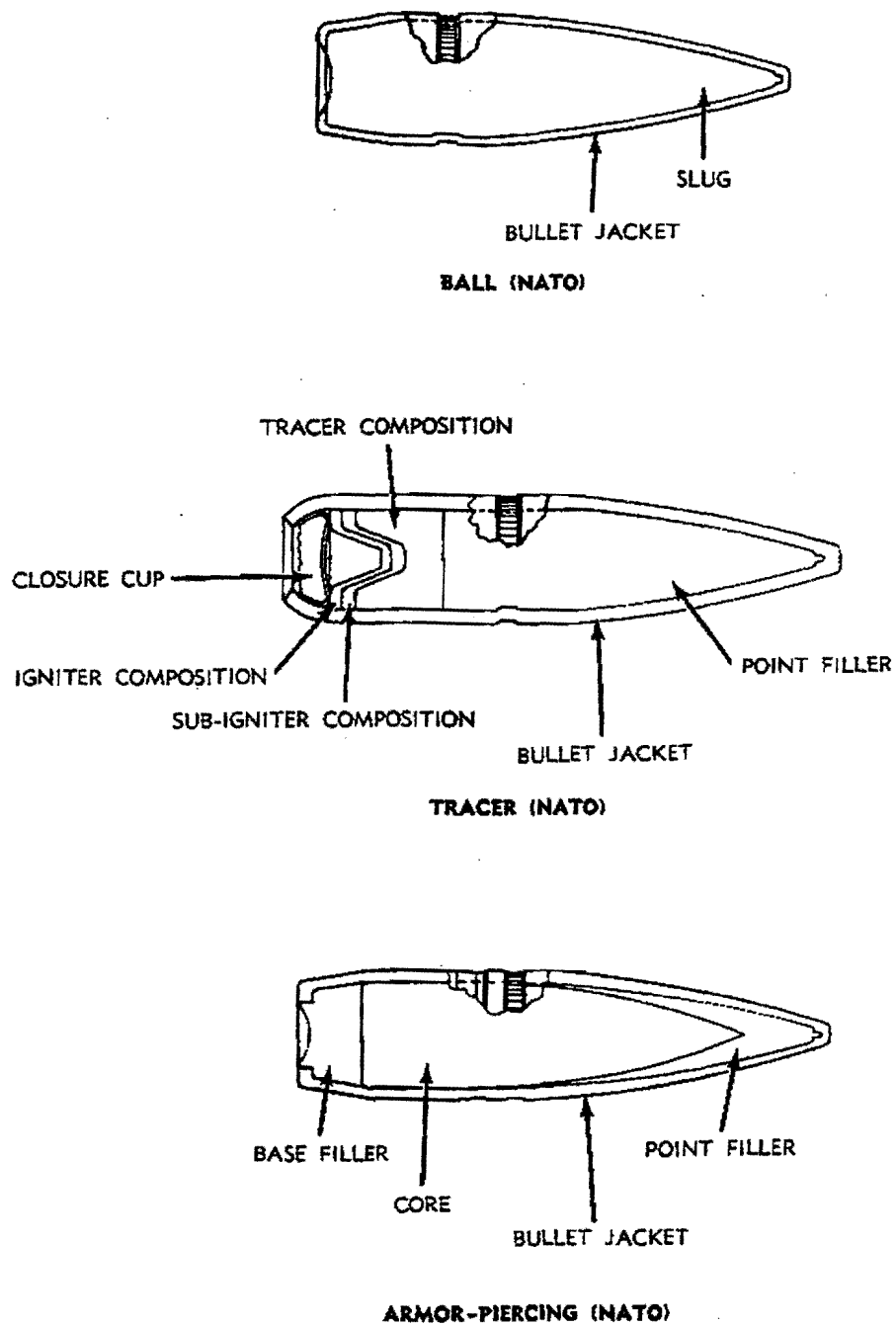
Figure 1. Typical cartridge (sectional)

**General.** Small-arms ammunition, as used herein, describes a cartridge or families of cartridges intended for use in various types of hand-held or mounted weapons through 30 millimeter. Within a caliber designation, these weapons may include one or more of the following: rifles (except recoilless), carbines, pistols, revolvers, machineguns and shotguns. For purposes of this publication, small-arms ammunition may be grouped as cartridges intended primarily for combat or training purposes (API, HEI, tracer or ball); for training purposes only (blank or dummy); or for special purposes (rifle grenade or spotter-tracer). Refer to TM 9-1306-200 for more detailed information on small-arms ammunition.

**Cartridges.** In general, a small-arms cartridge is identified as an assembly of a cartridge case, primer, a quantity of propellant within the cartridge case, and a bullet or projectile. Blank and rifle grenade cartridges are sealed with paper closure disks in lieu of bullets. Dummy cartridges are composed of a cartridge case and a bullet. Some dummy cartridges contain inert granular materials to simulate the weight and balance of live cartridges. A typical cartridge and the terminology of its components are shown in figure 1.

**Case.** Although steel, aluminum, zinc and plastic materials have been used experimentally, brass, a composition of 70 percent copper and 30 percent zinc, is the most commonly used material for cartridge cases. Steel, as well as brass, is an approved material for caliber .45 cartridge cases. Brass, paper and plastic are used for 12 gage shotshell bodies and aluminum is used for military-type .410 gage shotshell bodies.

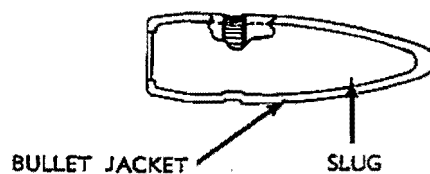




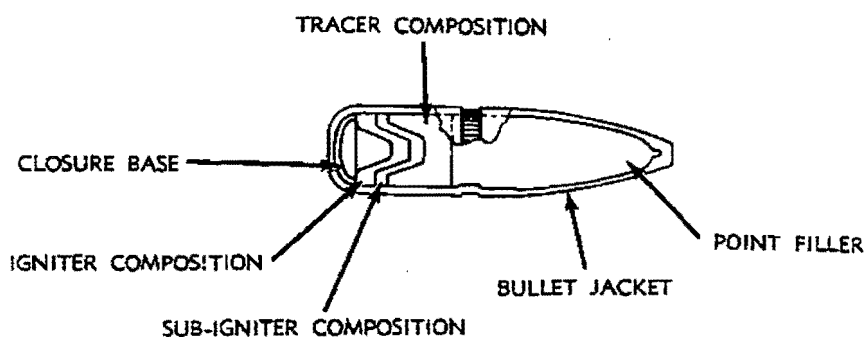
MU-D 2233

Figure 2. 7.62 mm bullets (sectional)

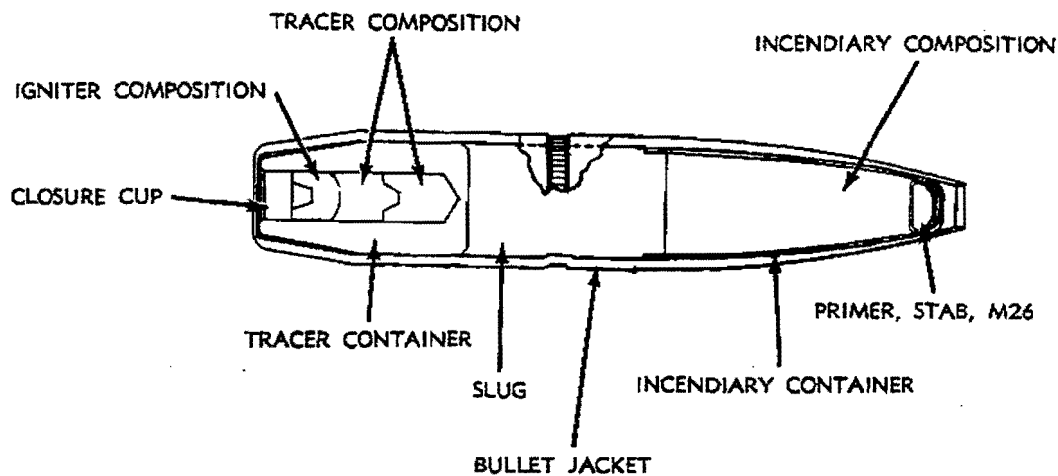




**5.56 MM BALL**



**5.56 MM TRACER**

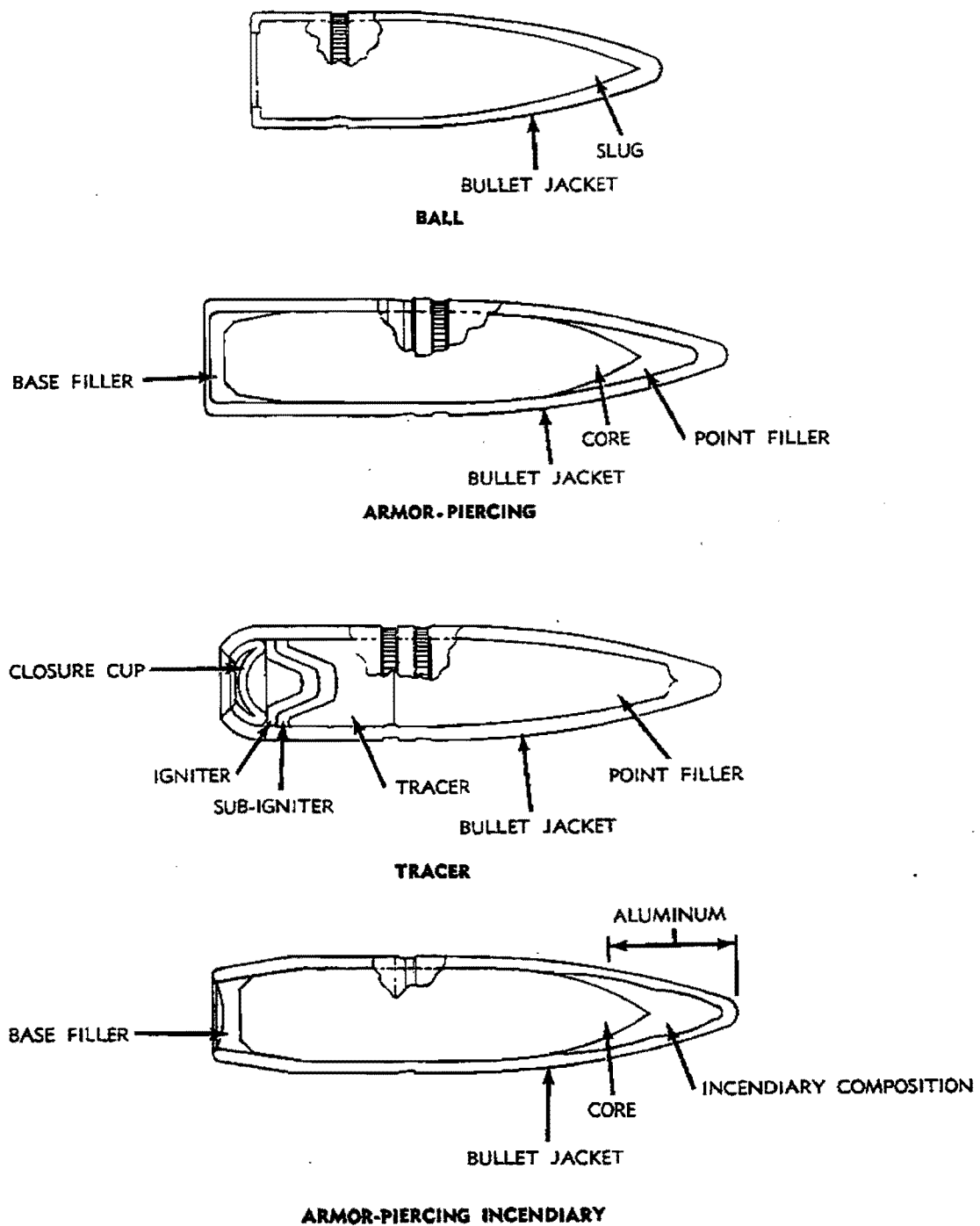


**CALIBER .50, SPOTTER TRACER**

MU-D 2234

*Figure 3. 5.56mm and caliber .50 spotter tracer bullets (sectioned).*





MU-D 2235

Figure 4. Caliber .30 bullets (sectional).





**BALL**



**BLANK**



**HIGH-PRESSURE TEST (HPT)**



**MATCH**



**ARMOR-PIERCING (AP)**



**BALL, FRANGIBLE**



**TRACER**



**DUMMY, INERT-LOADED**



**DUMMY**



**DUPLEX**

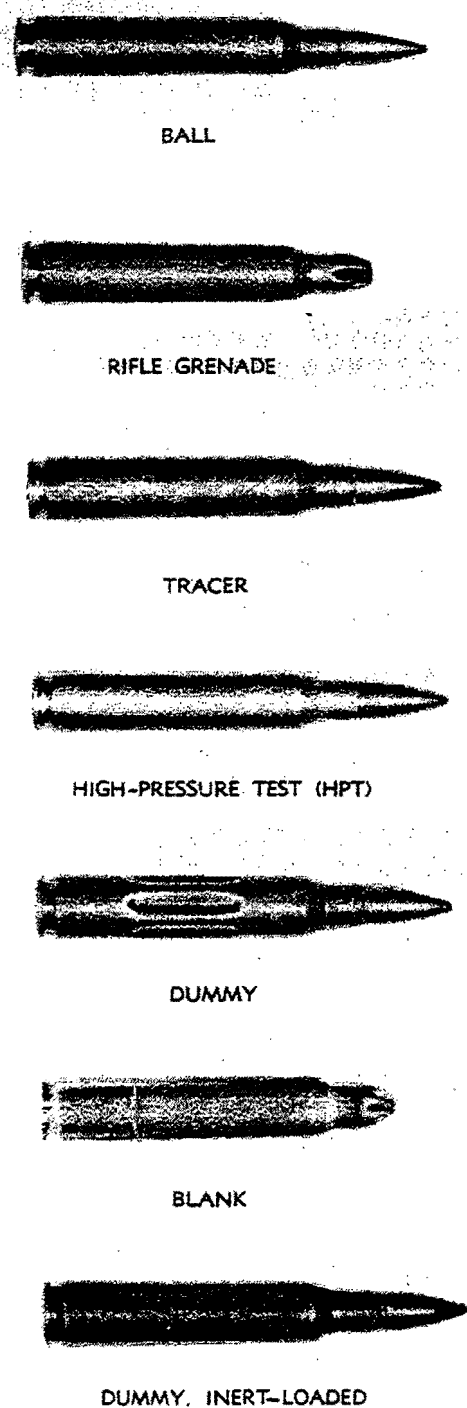


**RIFLE GRENADE**

MU-D 2236

*Figure 5. 7.62mm cartridges*





MU-D 2237

Figure 6. 5.56mm cartridges

*Propellant.* Cartridges are loaded with varying weights of propellant. This is to impart sufficient velocity (within safe pressures) to the projectile to obtain the required ballistic performance. These propellants are either of the single-base (nitrocellulose) or double-base (nitrocellulose and nitroglycerine) type. The propellant grain configuration may be cylindrical with a single, lengthwise perforation, spheroid (ball) or flake. Most propellants are coated with a deterrent (to assist in controlling the rate of combustion) and with a final coating of graphite (to facilitate flow of propellant and eliminate static electricity in loading cartridges).

*Primer.* Small-arms cartridges contain either a percussion or electric primer. The percussion primer consists of a brass or gilding metal cup that contains a pellet of sensitive explosive material secured by a paper disk and a brass anvil. The electric primer consists of an electrode button in contact with the priming composition, a primer cup assembly and insulator. A blow from the firing pin of the weapon on the center of the percussion primer cup base compresses the primer composition between the cup and the anvil. This causes the composition to explode. The function of the electric primer is accomplished by a firing pin with electrical potential, which contacts the electrode button. This allows current to flow through the energy-sensitive priming composition to the grounded primer cup and cartridge case, exploding the priming composition. Holes or vents in the anvil or closure cup allow the flame to pass through the primer vent in the cartridge case and ignite the propellant. Rimfire ammunition, such as the caliber .22 cartridge, does not contain a primer assembly. Instead, the primer composition is spun into the rim of the cartridge case and the propellant is in intimate contact with the composition. On firing, the firing pin strikes the rim of the cartridge case, compressing the primer composition and initiating its explosion.

*Bullet.* With few exceptions, bullets through caliber .50 are assemblies of a jacket and a lead or



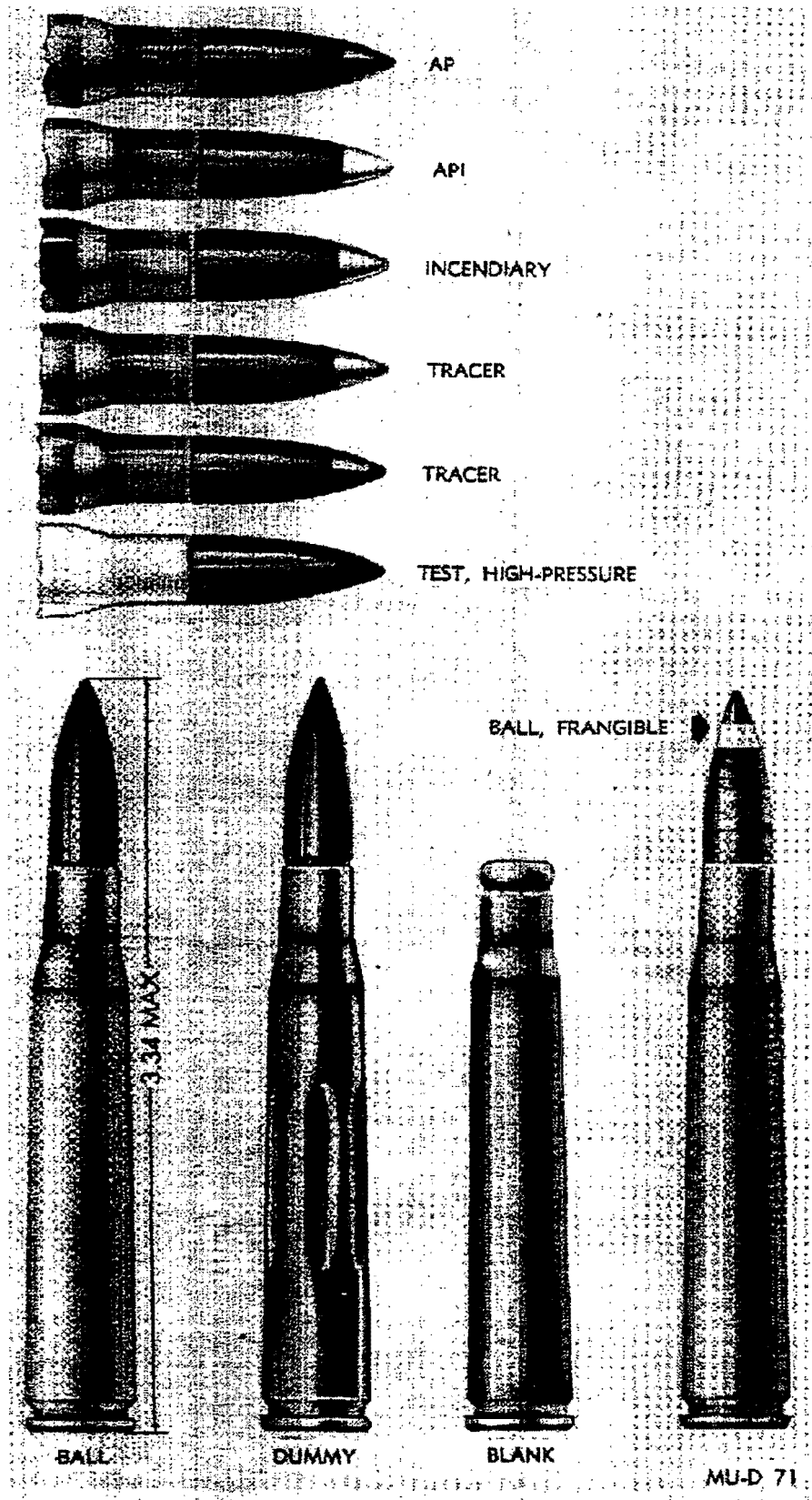


Figure 7. Caliber .30 cartridges



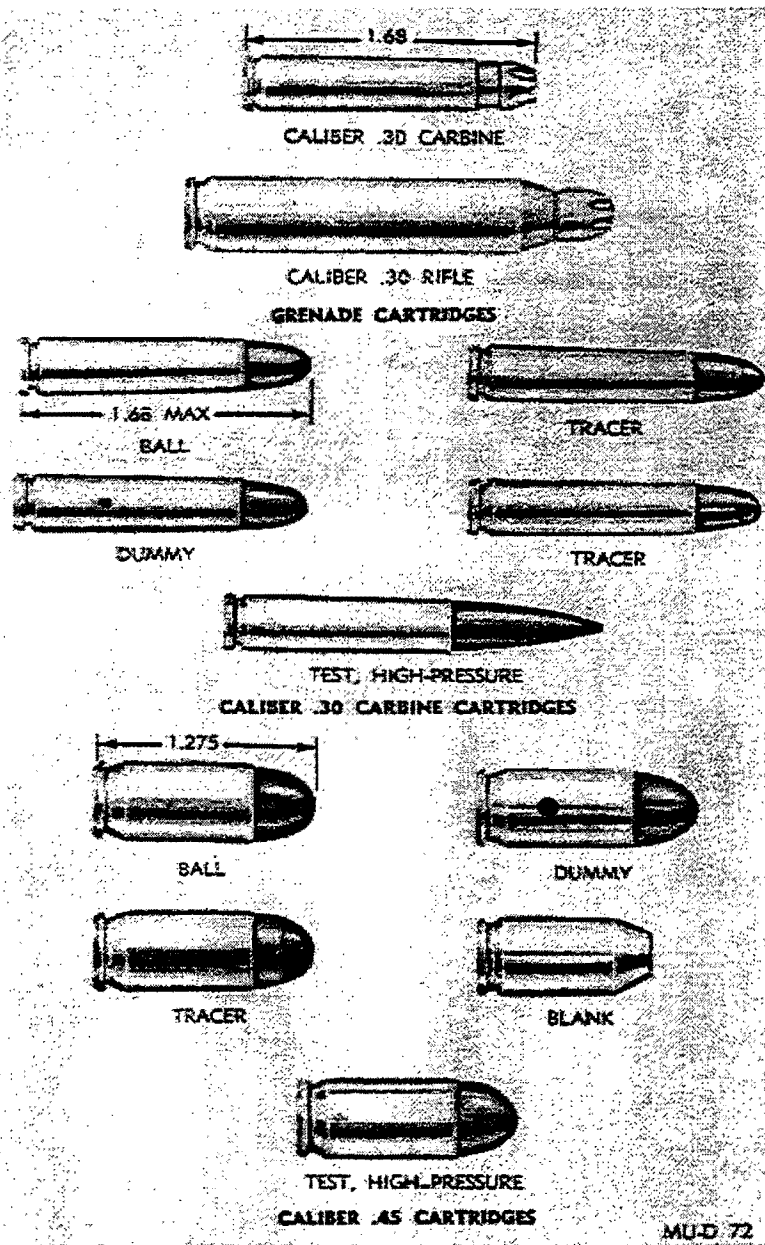


Figure 8. Caliber .30 carbine and caliber .45 cartridges

steel core. They may contain other components or chemicals which provide the terminal ballistic characteristics of the bullet type. The bullet jacket may be either gliding metal, gliding-metal clad steel, or copper plated steel. Caliber .30 and 7.62mm frangible bullets are molded of powdered lead and a friable plastic which pulverizes into dust upon impact with the target. The pellets used in the shotgun shells are spheres of lead alloys varying from 0.08 inch to 0.33 inch in diameter



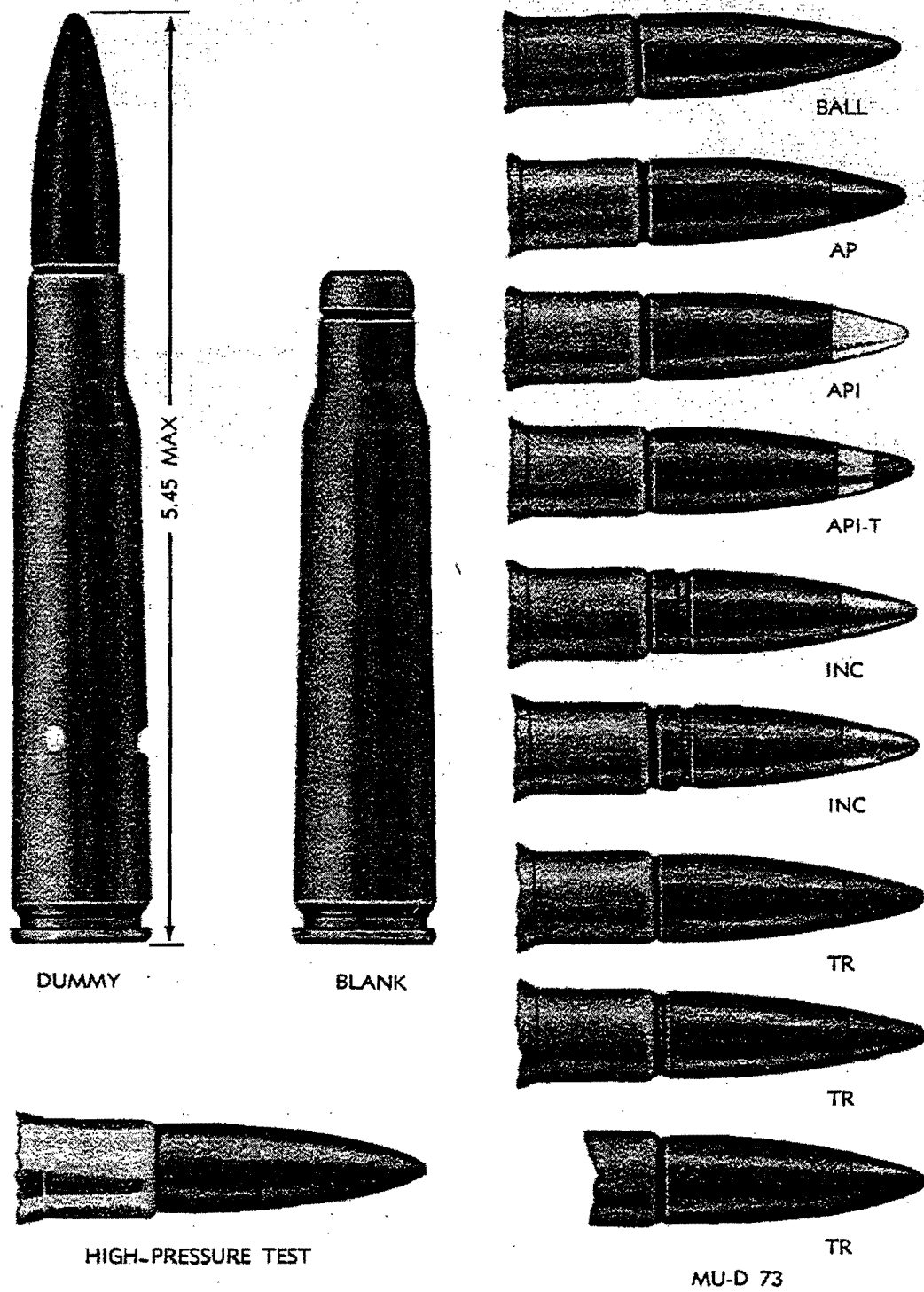


Figure 9. Caliber .50 cartridges



**Ball Cartridge.** The ball cartridge is intended for use in rifles, carbines, pistols, revolvers and/or machineguns against personnel and unarmored targets. The bullet, as designed for general purpose combat and training requirements, normally consists of a metal jacket and a lead slug. Caliber .60 ball bullet and 7.62-mm, ball M59 bullet contain soft steel cores.

**Tracer Cartridge.** By means of a trail of flame and smoke, the tracer cartridge is intended to permit visible observation of the bullet's in-flight path or trajectory and the point of impact. It is used primarily to observe the line of fire. It may also be used to pinpoint enemy targets to ignite flammable materials and for signaling purposes. The tracer element consists of a compressed, flammable, pyrotechnic composition in the base of the bullet. This composition is ignited by the propellant when the cartridge is fired. In flight, the bullet emits a bright flame which is visible to the gunner. Trace burnout occurs at a range between 400 and 1,600 yards, depending upon the caliber of ammunition.

**Match Cartridge.** The match cartridge is used in National and International Match Shooting competitions. The bullet consists of a gliding-metal jacket over a lead slug. The cartridges are identified on the head face with the designation NM (National Match) or Match.

**Armor-Piercing Cartridges.** The armor-piercing cartridge is intended for use in machine-guns or rifles against personnel and light armored and unarmored targets, concrete shelters, and similar bullet-resisting targets. The bullet consists of a metal jacket and a hardened steel-alloy core. In addition, it may have a base filler and/or a point filler of lead.

**Armor-Piercing-Incendiary Cartridge.** The armor-piercing-incendiary cartridge is used in rifles or machineguns as a single combination cartridge in lieu of separate armor-piercing and incendiary cartridges. The bullet is similar to the armor-piercing bullet, except that the point filler is incendiary mixture instead of lead. Upon impact with the target, the incendiary mixture

burst into flame and ignites flammable material.

**Armor-Piercing-Incendiary Tracer Cartridge.** The bullet of the armor-piercing-incendiary-tracer cartridge combines the features of the armor-piercing, incendiary, and tracer bullets and may be used to replace those cartridges. The bullet consists of a hard steel core with compressed pyrotechnic mixture in the cavity in the base of the core. The core is covered by a gilding-metal jacket with incendiary mixture between the core point and jacket. This cartridge is for use in caliber .50 weapons only.

**Duplex Cartridge.** The duplex cartridge contains two special ball type bullets in tandem. The front bullet is positioned partially in the case neck, similarly to a standard ball bullet. The rear bullet, positioned completely within the case, is held in position by a compressed propellant charge. The base of the rear bullet is angled so that in flight, it follows a path slightly dispersed from that of the front bullet.

**Spotter-Tracer Cartridge.** The spotter-tracer cartridge is intended for use in coaxially mounted caliber .50 spotting rifles. The bullet trajectory closely approximates that of 106mm projectiles. Thus, this cartridge serves as a fire control device to verify weapon sight settings before firing 106mm weapons. The bullet contains an impact detonator and incendiary composition which identify the point of impact by flash and smoke.

**Blank Cartridge.** The blank cartridge is distinguished by absence of a bullet. It is used for simulated fire, in training maneuvers, and for saluting purposes. It is fired in rifles and machineguns equipped with blank firing attachments.

**Grenade Cartridge.** The grenade cartridge is used to propel rifle grenades and ground signals from launchers attached to rifles or carbines. All rifle grenade cartridges are distinguished by the rose petal (rosette crimp) closure of the case mouth.



**Frangible Cartridge.** The caliber .30 frangible cartridge, designed for aerial target training purposes, is also used in rifles and machineguns for target shooting. Caliber .30 and 7.62mm frangible cartridges are used in tank machineguns, firing single shot, for training in tank gunnery. At its normal velocity, the bullet, which is composed of powdered lead and friable plastic, will completely disintegrate upon striking a 3/16-inch aluminum alloy plate at 100 yards from the muzzle of the gun. These cartridges are not to be used on any but well ventilated indoor ranges to preclude buildup of toxic bullet dust. Inhalation of bullet dust may be injurious to health

**Incendiary Cartridge.** The incendiary cartridge was designed for aircraft and ground weapon use to ignite combustible targets (e.g., vehicular and aircraft fuel tanks). The bullet contains a compressed incendiary mixture which ignites upon impact with the target. The incendiary cartridge has been superseded by the API and APIT cartridges because of their improved terminal ballistic effects

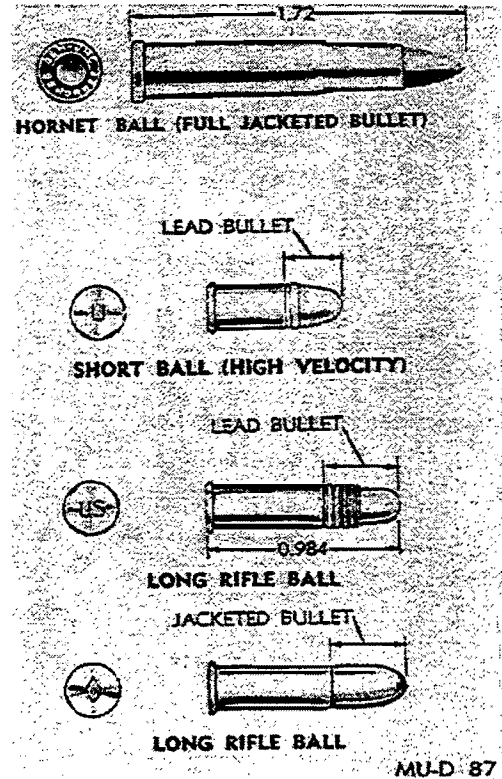
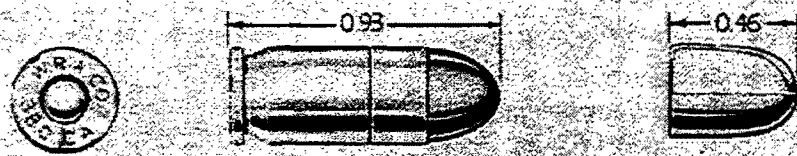
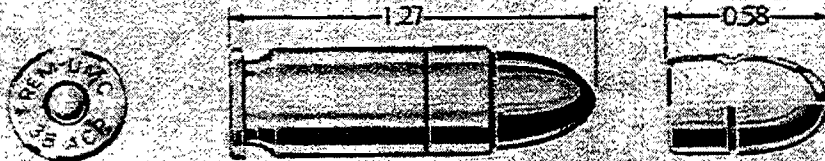


Figure 11. Caliber .22 cartridges

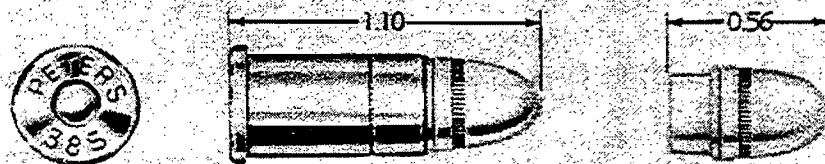




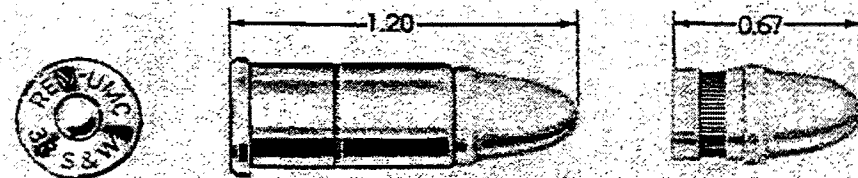
**CALIBER .380, BALL, AUTOMATIC PISTOL,  
95-GRAIN BULLET (9-MM SHORT)**



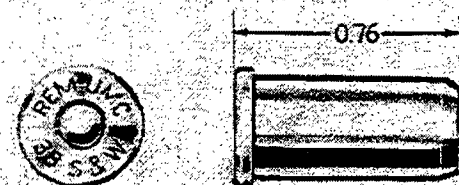
**BALL, SUPER AUTOMATIC COLT, 130-GRAIN  
BULLET, METAL JACKET**



**BALL, SHORT COLT, 125- OR 130-GRAIN BULLET**



**BALL, S&W, 146-GRAIN BULLET**



**BLANK, REVOLVER, S&W**

ORD D109-A

*Figure 12. Caliber .38 cartridges.*



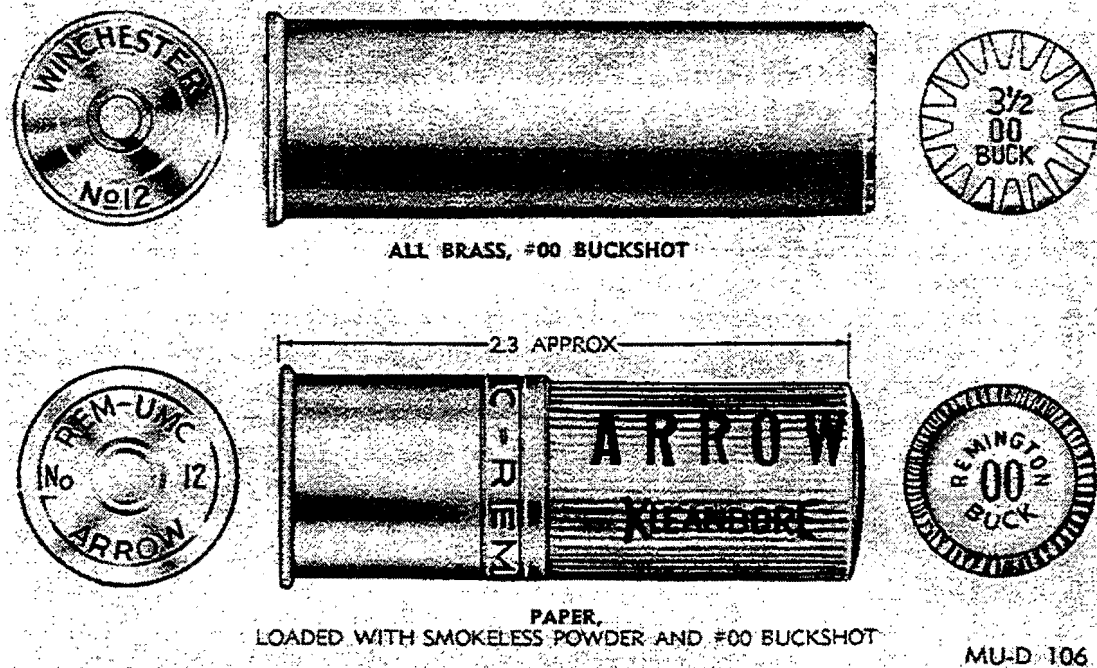


Figure 13. 12 gage shotgun shells.

**Target-Practice Cartridge.** The 20mm target-practice cartridge is the conventional steel shell with steel nose plug. It is used primarily for training purposes. This is not a combat cartridge; hence, no fuze is used in the assembly.

#### *Special Purpose Cartridge.*

*Cartridges of various calibers.* (fig. 11 through 13), which consist of different types of projectiles and bullets, are used for training and special purposes. They include the following:

- (1) Caliber .22 long rifle and caliber .38 and .45 wad-cutter cartridge for target shooting.
- (2) Caliber .45 blank cartridges fired in exercises to condition dogs to gun fire.
- (3) Caliber .22 hornet and .410 shotgun cartridges for firing in Air Force combination (survival) weapons for hunting purposes.
- (4) Caliber .45 line-throwing cartridges for firing in caliber .45 line-throwing rifles. The Navy uses these for throwing lines from ship-to-ship. The Army Signal Corps uses these for projecting signal wires over elevated terrain
- (5) Shotshells containing the designated shot sizes as required for the following:
  - (a) 12 gage #00 Buck for guard duty
  - (b) 12 gage #4 Buck for guerrilla purposes.
  - (c) 12 gage #6, 7½ and 8 shot for clay target shooting for training purposes.
  - (d) .410 gage #7 shot for caliber .22/.410 survival weapons maintained by aircraft.

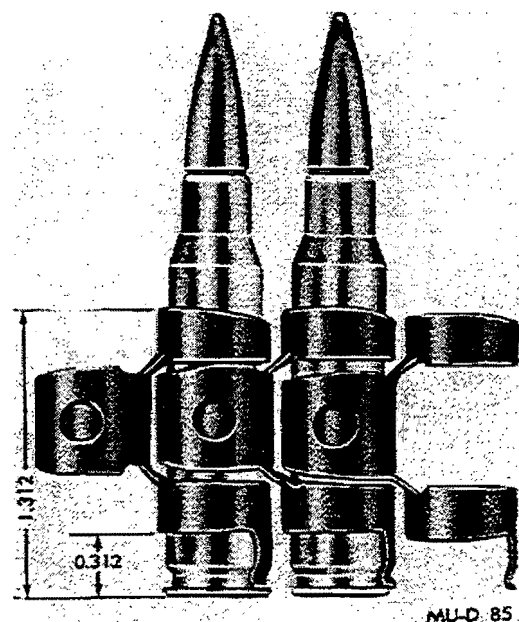


Figure 14. Linked 7.62-mm cartridge



*Special purpose cartridges.* These also include the following types of military cartridges:

- (1) *Dummy.* The dummy cartridge is used for practice in loading weapons and simulated firing to detect flinching of personnel when firing weapons. It consists of a cartridge case and a ball bullet. Cartridge identification is by means of holes through the side of the case or longitudinal corrugations in the case and by the empty primer pocket.
- (2) *Dummy inert-loaded.* This cartridge consists of a cartridge case, a ball bullet and inert granular material in the case simulating the weight and balance of a live cartridge. The exterior of the cartridge is identified by a black chemical finish and by the absence of a primer. This cartridge is used by installations for testing weapon function, linkage and feed chutes.
- (3) *High-pressure test.* High-pressure test ammunition is specially loaded to produce pressures substantially in excess of the maximum average or individual pressures of the corresponding service cartridge. This cartridge is not for field issue. It is used only by armorers and weapons mechanics for proof firing of weapons (rifles, pistols, machine guns) at place of manufacture, test and repair. Because of excessive pressures developed by this type of ammunition, and the potential danger involved in firing, proofing of weapons is conducted only by authorized personnel from fixed and shielded rests by means of a lanyard or other remote control methods.

#### *Metallic Links and Clip.*

*Metallic links.* (fig. 14 and 15) are used with caliber .30, caliber .50, 5.56mm, 7.62mm and 20mm cartridges in machine guns. The links are made of steel, surface treated for rust prevention. They are used to assemble cartridges into linked belts of 100 to 750 cartridges per belt. The links must meet specific test and dimension requirements to assure satisfactory ammunition feed and functioning in the machine gun under all training and combat service conditions.

*Different configurations of cartridge clips.* These permit unitized packages of ammunition. This facilitates transfer of cartridges to appropriate magazines for caliber .30, 7.62mm and 5.56mm rifles. The caliber .30 eight-round clip feeds eight cartridges as a unit into the receiver of the rifle. The caliber .45 clip feeds three cartridges as a unit into the revolver cylinder. Five-round and eight-round clips are used with caliber .30 cartridges; five-round clips with 7.62mm cartridges; ten-round clips with caliber .30 carbine and 5.56-mm cartridges; and three-round clips with caliber .45 cartridges

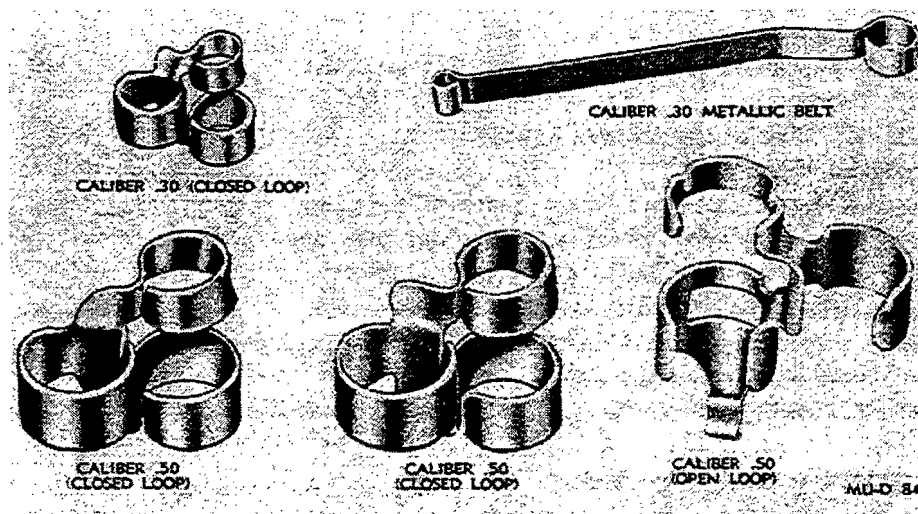


Figure 15. Links for caliber .30 and caliber .50 ammunition



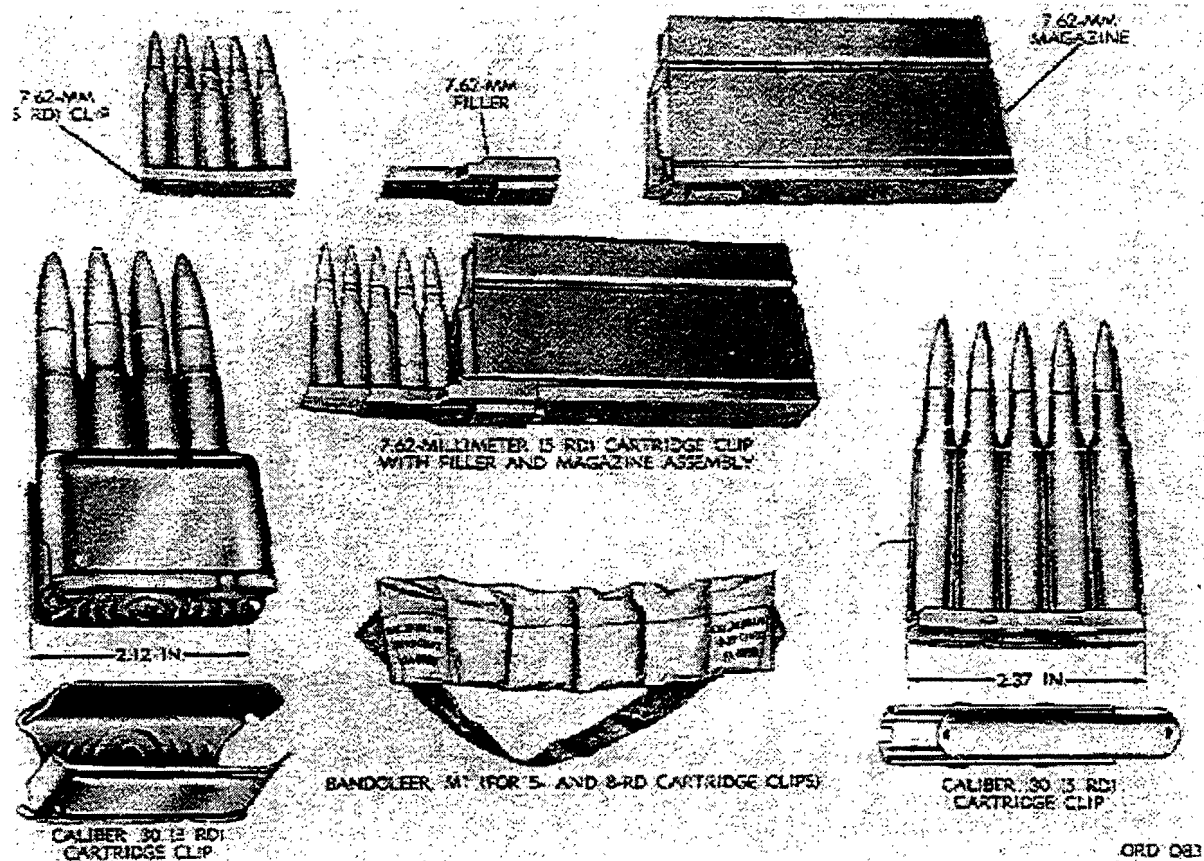


Figure 16. Cartridges in 20-round cartons in ammunition box

#### *Packing and Identification Marking.*

**Packing.** These containers and methods for packing military small-arms ammunition are specified in drawings, specifications or, as required, in the procurement contract. Military containers presently being manufactured have been limited to a few standard types designed to withstand all conditions commonly encountered in handling, storage and transportation of ammunition. Military cartridges, except 20mm, are packed in metallic ammunition boxes, over-packed in wooden wire-bound crates. Twenty millimeter cartridges are packed in ammunition boxes only. When commercial cartridges are not packed in a military pack, they are packed in accordance with standard commercial practices.

**Identification Markings.** Each outer shipping container and all inner containers are fully marked to identify the ammunition. Wire-bound boxes are marked in black and ammunition boxes are painted olive drab, with markings in yellow. When linked ammunition is functionally packed, component lot numbers are replaced by a functional lot number. Typical packing and identification markings are illustrated in figures 17 and 18.



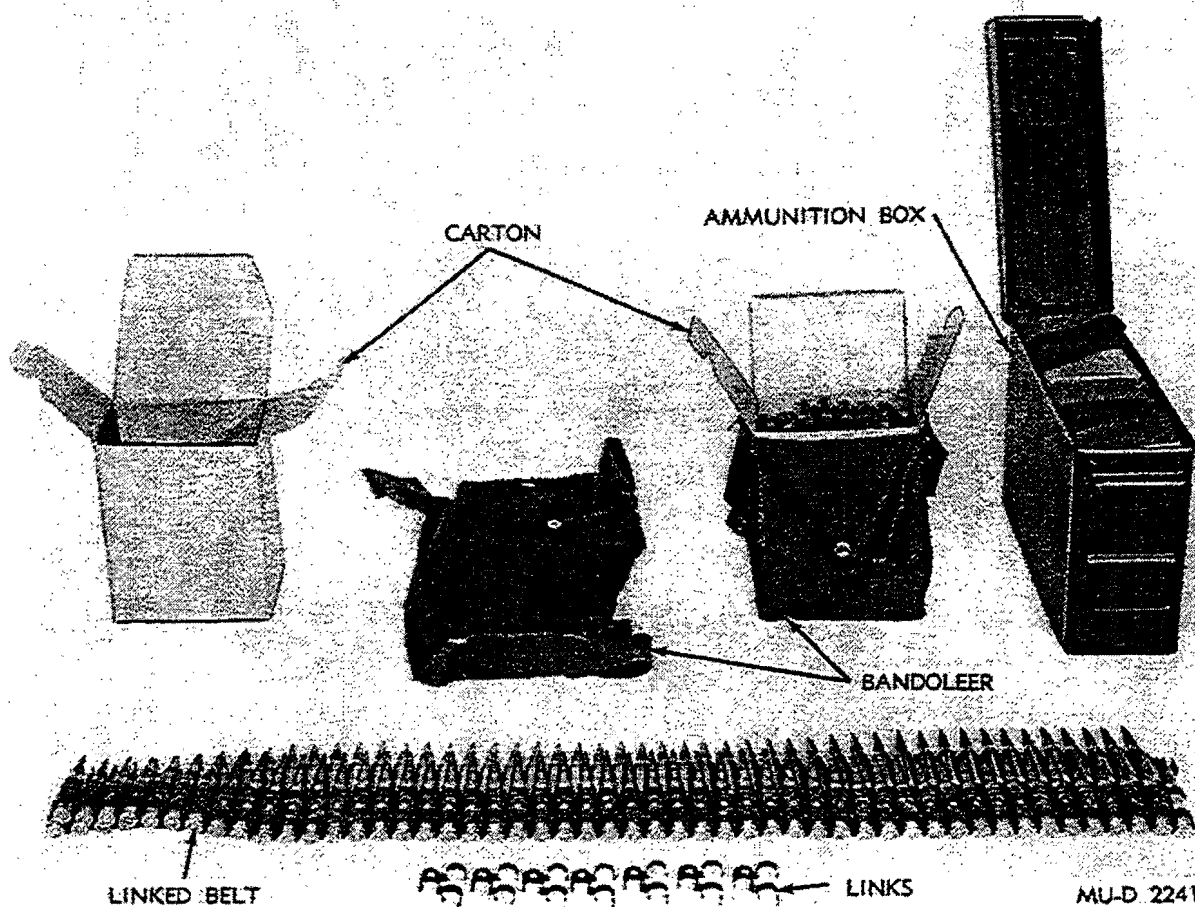


Figure 17. Cartridges, link belt, cartons, bandoleers and ammunition box.

*Care, Handling and Preservation.*

Small-arms ammunition is comparatively safe to handle. It is packed to withstand transportation, handling and storage conditions normally encountered in the field. However, consideration should be given to general handling precautions pertaining to ammunition and explosives.

**Reference:** This data is a reprint of Chapter 3, TM 9-1300-200, *Ammunition General*, October 1969, excluding information on 20mm and 30mm ammunition.



**Appendix B**  
**Soil Boring Logs, Test Pit Logs, Well**  
**Construction Diagrams, and Temporary Well**  
**Abandonment Records**

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# CH2MHILL

PROJECT NUMBER 377812	BORING NUMBER SB01/TW01	SHEET 1 OF 1
SOIL BORING LOG		

PROJECT CTC-011 LOCATION CJCA Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Power Probe 9500 VTR  
 WATER LEVELS 9' bgs START 7/26/09 1340 FINISH 7/26/09 1400 LOGGER D. Brown / C.L.T

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' silty sand (SM) Black, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	3'		4-5' No Recovery 5-10' Sand (SP) light grey/white, moist, loose, fine grained	Water table @ 9' bgs XRF 16 Detections
10	8-12'	DP-3	4'		10-14' Clay (CL) Dark grey, wet, stiff	Collected sample CJCA-SB01-2-7-09C @ 1410.
	12-16'	DP-4	4'		14-16' Sand (SP) wet, same as 5-10'	
15					End of Boring 16' bgs	Construction details for CJCA-TW01 1" prepacked screen 1 bag of #2 sand Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs
						Driller could not drill beyond 16' bgs.



PROJECT NUMBER

377812

BORING NUMBER

S602

SHEET 1 OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICA LOCATION Camp Lejeune, NC  
 ELEVATION not surveyed DRILLING CONTRACTOR SAEDA CO  
 DRILLING METHOD AND EQUIPMENT HAIR DPT w/Geoprobe 540T  
 WATER LEVELS 6' bgs START 0925 7-29-09 FINISH 0940 7/29/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DE-1	3			0-1 No Recovery 1-5 Silty Sand (SM), black, moist, m dense, vfg, no odor	XRF 2-4' = ND
5-8	DE-2	4			5-8 Sand (SP), gray, wet, dense, vfg	XRF 4-6' = ND Water @ 6' bgs
8-10					Boring completed @ 8' bgs	Sample: CICA-S602-2-G-09C CICA-S602-2-G-09C-MS CICA-S602-2-G-09C-SD



PROJECT NUMBER 377812	BORING NUMBER SB03/TW02	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-011 LOCATION CJCA Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 UTR  
 WATER LEVELS 10' bgs START 7/26/09 0935 FINISH 7/26/09 1015 LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' Peat (PT) Black, loose, moist 4-5' No Recovery 5-9.5' clayey sand (sc) Brown/grey, moist, medium dense, fine grained	Hand Auger cleared 0-5' bgs
10	4-8'	DP-2	3'		9.5-10.5' Silty sand (SM) light grey, moist, loose, fine grained wet @ 10' bgs	Water table @ 10' bgs
15	8-12'	DP-3	4'		10.5-15' sand (SP) light grey, wet, loose, fine grained	XRF No Detections
20	12-16'	DP-4	4'		15-16' clay (CL) Dark grey, wet, stiff End of Boring 16' bgs	Driller could not drill past 16' bgs
						Well Construction Details for CJCA-TW02 1" prepacked screen 1 bag #2 sand (solb) Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs
						Collected sample CJCA-SB03-2-7-09C @ 1030



PROJECT NUMBER

377812

BORING NUMBER

5604

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CJO-11 CJALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAEDAKODRILLING METHOD AND EQUIPMENT HA & DPT w/Geoprobe 540TWATER LEVELS ---START 0855 7/29/09FINISH 0900 7/29/09LOGGER S. Bendhe

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DR-1	3		0-1 No Recovery 1-4 Silty Sand (SM), gray w/ some black, moist, loose, vfg, no odor	XRF 2-4": ND
	4-8	DR-2	4		4-6 Sand w/ Clay (SP-SC), gray, moist, dense, vfg 6-8 Sand (SP), lt gray, moist, loose, vfg	XRF 4-6": Sb 158 ppm XRF 6-7": Pb 11 ppm
10					Boring completed @ 8' bgs	Sample: CJCA-5604-4-7-09C



## SOIL BORING LOG

PROJECT GTO-11 CICALOCATION Camp Lejeune, NCELEVATION not surveyedDRILLING CONTRACTOR SAEDACLODRILLING METHOD AND EQUIPMENT HA & DRT w/ Geoprobe 6010 DTWATER LEVELS 12' bgsSTART 1435 7/26/09FINISH 1515 7/26/09LOGGER S. Berville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	3			0-1 No Recovery 1-3.5 Clayey Sand (SC), gray, moist, dense, vfg, little silt	XRF 2-4' : ND
4-8	DP-2	4			3.5-8 Sand w/ Silt (SP-SM), gray, dense, moist, vfg	XRF 4-6' : ND XRF 6-7' : ND
8-12	DP-3	2			8-10 No Recovery 10-14 <sup>4</sup> SAA (3.5-8) 14-18 Silty Clay (CL), d. gray, wet, soft, low plasticity	
12-16	DP-4	4			18-20 Sand w/ Silt (SP-SM), gray, wet, m. dense, vfg	water @ 12' bgs
16-20	DP-5	4				Sample: CICA-5605-2-7-09C
20					Boring completed @ 20' bgs	Well construction: 10-20' : 1" screen 0-10' : 1" PVC casing 9-20' : Sand 7-9' : Bentonite chips PVC stick up:



PROJECT NUMBER

377812

BORING NUMBER

S606

SHEET

OF 1

## SOIL BORING LOG

PROJECT CJ0-11 CJCALOCATION Camp Lejeune, NCELEVATION Not SurveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT HRD DPT w/ Geoprobe 54DTWATER LEVELS —START 0945 7/29/09 FINISH 1000 7/29/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS  6"-6"-6" (N)	SOIL DESCRIPTION  SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS  DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	4			0-4 Silty Sand (SM), gray & tan, dry, loose, vfg	KRF 2-4' : ND
4-8	DP-2	4			4-8 Sand (SP), lt tan, moist, loose, vfg	KRF 4-6' : ND KRF 6-7' : ND
					Boring completed @ 8' bgs	Sample: CJCA-S606-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB07/TW04

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACLO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/620 probe 6610 ST

WATER LEVELS 10' bgs

START 1025 7/26/09

FINISH 1055 7/26/09

LOGGER S. Berille

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	HA-1	0		0-4.5 No Recovery (HA) 4.5-9 Sand (SP), lt. gray, moist to dry, loose, vfg	
5	4-8	DP-1	3.5		9-14 Sand w/Silt (SP-SM), gray w/orange, moist to wet, vfg, m. dense	XRF 4-6' : ND XRF 6-7' : ND
10	8-12	DP-2	4		14-15 Sandy Clay (CL), d. gray, wet, soft, vfg	water @ 10' bgs
15	12-16	DP-3	4		15-16 Sand w/Silt (SP-SM), gray, moist, dense, vfg	Sample: CICA-SB07-4-7-09C
20					Boring completed @ 16' bgs	Well construction: 6-16' : 1" Screen 0-6' : PVC casing (1") 5-16' : Sand 4-5' : Bentonite chips PVC Shroud



PROJECT NUMBER

377812

BORING NUMBER

5608

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CJ0-11 CJCALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAENACCODRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 54DTWATER LEVELS —START 0830 7/29/09 FINISH 0840 7/29/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	3			0-1 No Recovery 1-4 Silty Sand (SM), gray, dry, loose, vfg, trace clay	XRF 2-4: ND
4-8	DP-2	4			4-7 Sand (SP), lt gray, dry, denser, little clay, vfg 7-8 Sand (SP), lt gray w/ orange, dry, loose, vfg	XRF 4-6: ND XRF 6-7: ND
					Boring completed @ 8' bgs	Sample: CJCA-5608-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

5609/TW05

SHEET

OF 1

## SOIL BORING LOG

PROJECT CTD-11, CICALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAE DACCDRILLING METHOD AND EQUIPMENT HA r DPT w/ Geoprobe 6610 DTWATER LEVELS 14' bgsSTART 0820 7/26/09FINISH 0920 7/26/09LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	1.5		0-2.5 No Recovery 2.5-4 Sand w/ clay (SP-SC), d. tan, dry, m. dense, vfg, little silt	XRF 2-4": Zn 69 XRF 4-6": ND
	4-8	DP-2	2.5		4-5.5 No Recovery 5.5-6.5 SAA (2.5-4) 6.5-14 Sand (SP), lt gray, dry to moist, loose, vfg, trace silt	XRF 6-7": ND
	8-12	DP-3	4		14-20 Silty Sand (SM), gray w/ orange, wet, m. dense, vfg, trace clay	
15	12-16	DP-4	4		20-24 No Recovery	water @ 14' bgs
	16-20	DP-5	4			Sample: CICA-5609-2-4-09C CICA-5609D-2-4-09C
20	20-24	DP-6	0			
25					Boring completed @ 24' bgs	Well construction: 12-22': 1" screen 0-12': 1" PVC casing 11-22': Sand 9-11': Bentonite chips PVC stick up ~ 1.5'



PROJECT NUMBER

377812

BORING NUMBER

5610

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CJCA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA + DPT w/ Geoprobe 54DT

WATER LEVELS 6.5' bgs

START 1645 7/28/09

FINISH 1700 7/28/09

LOGGER J. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DP-1	4		0-2 Peat (Pt), d.brown, dry, loose, sand & OM	KRF 2-4': ND
5	4-8	DP-2	4		2-7 Sand (SP), gray, moist, loose, vfg	KRF 4-6': ND
10					7-8 Sand w Clay (SP-SC), gray, wet, m dense, vfg, little silt	water @ 6.5' bgs
					Boring completed @ 8' bgs	Sample: CJCA-5610-2-6-09C



PROJECT NUMBER

377812

BORING NUMBER

SB11 HW06

SHEET

OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICA LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEVACO  
 DRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 610DT  
 WATER LEVELS 11' bgs START 1235 7/26/04 FINISH 1315 7/26/04 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF measurements in ppm
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	2			0-2 No Recovery 2-4 Silty Sand (SM), tan, dry, m. dense, vfg. trace clay	XRF 2-4' : ND
4-8	DP-2	4			4-11 Sand (SP), lt gray, dry, loose, vfg, trace silt	XRF 4-6' : ND XRF 6-7' : ND
8-12	DP-3	4			11-20 Sand w/ Silt (SP-SM), gray w/ orange, m. dense, vfg, wet	water @ 11' bgs
12-16	DP-4	4				Sample: CICA-SB11-2-7-09C
16-20	DP-5					
20					Boring completed @ 20' bgs	Well construction: 6-16' : 1" Screen 0-6' : 1" PVC casing 5-16' : Sand 4-5' : Bentonite chips PVC sticking ~1'



PROJECT NUMBER

377812

BORING NUMBER

SB12

SHEET

1

OF

1

## SOIL BORING LOG

PROJECT CJ0-11 CICALOCATION Camp Lejeune NCELEVATION Not surveyedDRILLING CONTRACTOR SAFEDACCODRILLING METHOD AND EQUIPMENT HA 8 DPT w/ Geoprobe SMT

WATER LEVELS

START 1030 7/29/09FINISH 1045 7/29/09LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF results (ppm)
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-1	DP-1	1		0-2 Silty Sand (SM), d gray, dry, m dense, vfg	2-4': ND
	1-2	DP-2	2		2-4 Sand w/clay (SP-SC), d. tan, dry, v. dense, vfg	4-6': ND
10	4-8	DP-2	4		4-8 Sand (SP), lt gray, dry, loose, vfg	6-7': ND
					Boring completed @ 8' bgs	Sample: CICA-SB12-2-7-09C



PROJECT NUMBER 377812	BORING NUMBER SB13/TWO7	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTA-011 LOCATION CJCA Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 15.5' bgs START 7/26/09 0800 FINISH 7/26/09 0825 LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-3' silty sand (SM) brown/black, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		3-5' clayey sand (SC) light grey/tan, moist, medium dense	
10	8-12'	DP-3	3'		5-11' Sand (SP) white/tan, orange streaks, moist, medium dense fine grained	XRF No Detections
	12-16'	DP-4	2'		11-14' No Recovery 14-17' clayey sand (SC) same as 3-5' wet at 15.5'	
15	16-20'	DP-5	4'		17-19' sand (SP) grey/orange, wet, loose, fine grained	Water table @ 15.5' bgs
20					19-20' clayey sand (SC) same as 14-17'	CJCA-TWO7 Construction Details 1" pre-packed screen 1/2 of 50 lb bag #2 sand Screen: 10-20' bgs Sand: 10-20' bgs Bentonite: 9-10' bgs
					End of Boring 20' bgs	Collected samples CJCA-SB13-2-7-09C CJCA-SB13-2-7-09C-M5 CJCA-SB13-2-7-09C-SD @ 0840



PROJECT NUMBER

377812

BORING NUMBER

SB14

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACUS

DRILLING METHOD AND EQUIPMENT HA 8 DPT w/Geoprobe 54DT

WATER LEVELS

START 1610

7/28/09

FINISH 1625

7/28/09

LOGGER

S. Boudle

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-5 Silty Sand (SM), tan, dry, m. dense, trace clay	XRF 2-4": ND
	4-8	DP-2	4		5-8 Sand (SP), lt gray, moist, loose, vfg	XRF 4-6": ND XRF 6-7": ND
10					Boring completed @ 8' bgs	Sample: CICA-SB14-2-7-09C



PROJECT NUMBER 377812	BORING NUMBER SB15/TW08	SHEET 1 OF 1
SOIL BORING LOG		

PROJECT CTC-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEPACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTA  
 WATER LEVELS 10' bgs START 7/25/09 1650 FINISH 7/25/09 1715 LOGGER J. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	1'		0-3' No Recovery 3-4.5' Silty sand (SM) grey/tan, moist, loose, fine grained	Hand Auger clears 0-5' bgs.
	4-8'	DP-2	4'		4.5-5.0' Sandy clay (CL) orange/tan, moist, stiff 5-6' Clayey sand (SC) tan/orange, moist, dense, fine grained	Water table @ 10' bgs XRF 2-4' Nothing 4-6' Nothing
	8-12'	DP-3	3'		6-8' Sand (SP) white/orange, moist, loose, medium grained	6-7' CU = 14 PPM 2A = 20 PPM
	12-16'	DP-4	4'		8-9' No Recovery 9-15' Same as 6-8' wet @ 10' 15-16' Sandy clay (CL) orange/white, wet, very stiff	Collected sample CTCA-SB15-6-7-09C @ 1740
15					End of boring 16'	Well Construction Details 1" Prepacked Screen 1/2 bag of #2 Sand Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs well set @ 18' bgs Driller could not drill deeper than 16' bgs.



PROJECT NUMBER

377812

BORING NUMBER

SB16/TW09

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CIO II CICALOCATION Camp Lejeune, NCELEVATION Not SurveyedDRILLING CONTRACTOR SACDACCDRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 6610 DIWATER LEVELS 10' bgsSTART 1030 7/25/09FINISH 1130 7/25/09LOGGER S Berube

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-4 Clayey Sand (SC), tan, moist, v. dense, vfg	XRF 2-4': ND
	4-8	DP-2	4		4-9.5 Sand (SP), lt gray, dry, loose, vfg, few orange lenses, trace silt	XRF 4-6': ND XRF 6-7': ND
	8-12	DP-3	3		9.5-12 Sand w/ Silt (SP-SM), lt orange, wet, m. dense, vfg	water @ 10' bgs
	12-16	DP-4	1		12-15 No Recovery 15-16 SAA (9.5-12)	Sample: CICA-SB16-2-7-09C
20					Boring completed @ 16' bgs	Well construction: 6-16': 1" screen 0-6': 1" PVC casing 5-16': Sand 4-5': Bentonite chips PVC Stickup ~ 1.5'



PROJECT NUMBER

377812

BORING NUMBER

5617

SHEET 1 OF 1

## SOIL BORING LOG

PROJECT CU-11 CICA LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDALLO  
 DRILLING METHOD AND EQUIPMENT HA & DPT w/Geoprobe S4DT  
 WATER LEVELS — START 1440 7/28/09 FINISH 1500 7/28/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-2 Silty Sand (SM), d gray, dense, moist, vfg	XRF 2-4": NR
	4-8	DP-2	4		2-5 - Clayey Sand (SC), tan, dry, v dense 5-8 Sand (SP), lt gray, moist, loose, vfg	XRF 4-6": NR XRF 6-7": NR
10					Boring completed @ 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

SB18/TW10

SHEET

OF 1

## SOIL BORING LOG

PROJECT

CJO-11 CICA

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDALCO

DRILLING METHOD AND EQUIPMENT

HA &amp; DPT w/ Geoprobe G610

WATER LEVELS

5' bgs

START

310 7/25/09

FINISH

1450 7/25/09

LOGGER

S Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DR-1	3			0-1 No Recovery 1-3 Peat (Pt), d.brown, moist salty sand w/om	KRF 2-4' : ND
4-8	DR-2	4			3-11 Sand w/silt (SP-SM), gray w/orange, moist, m dense, vfg	KRF 4-5' : ND water @ 5' bgs
8-12	DR-3	4			11-12 Silty Sand (SM), d.gray, wet, m dense, little clay	Sample CICA SB18-2-5-09C
12-15					Boring completed @ 12' bgs	Well construction: 2-12' 1" screen 0-2' 1" PVC casing 1-12' Sand 0-1' Bentonite chips PVC stickup ~ 1'



PROJECT NUMBER

377812

BORING NUMBER

3819

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CJO-11 CICALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAENA CODRILLING METHOD AND EQUIPMENT HA + VPT w/Geoprobe 540TWATER LEVELS 7' bagSTART 1535 7/28/09FINISH 1540 7/29/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-6 Sand (SP), lt gray, dry, loose, vry, trace silt	KRF 2-4' : ND
	4-8	DP-2	4		6-8 Sand w/silt (SP-SM), lt orange, wet, m. dense	KRF 4-6' : ND KRF 6-7' : ND
10					Boring completed @ 8' bgs	Sample: CICA-SB19-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB20/TWII

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CIO-11, CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 6610 DT

WATER LEVELS 9.5' bgs

START 1600 7/25/09 FINISH 1635 7/25/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DR-1	4		0-2 Silty Sand (SM), d. gray, moist, loose, some OM, vfg	
					2-4 Sandy Clay (CL), gray w/ orange, moist, stiff, vfg	XRF 2-4' ND XRF 4-6' ND
	4-8	DR-2	4		4-11 Sand (SP), lt gray, dry, m. dense, trace silt, vfg, wet @ 9.5'	XRF 6-7' ND
10	8-12	DR-3	4		11-15 Sand w/ Silt (SP-SM), orange, wet, dense, vfg	water @ 9.5' bgs
					15-16 Sandy Clay (CL), d. gray, wet, soft, vfg, low plasticity	
	12-16	DR-4	4		16-20 No Recovery	Sampler CICA-SB20-2-7-09C CICA-SB20-2-7-09C
15	16-20	DR-5	0			
20					Boring completed @ 20' bgs	Well construction: 8-18': 1" screen 0-8': 1" PVC casing 7-18': Sand 6-7': Bentonite chips PVC Stickup: ~1.5'



PROJECT NUMBER

377812

BORING NUMBER

5621

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAENACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 54 DT

WATER LEVELS 7' bgs

START 1130 7/28/09

FINISH 1140 7/28/09

LOGGER S Bewick

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-3 Clayey Sand (SC), tan, dry, v. dense, vfg	XRF 2-4": NR
	4-8	DP-2	4		3-8 Sand (SP), lt gray, dry, loose, vfg	XRF 4-6": NR XRF 6-7": NR water @ 7' bgs
10						Sample: CICA-5621-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB22/TW12

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CTCA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 6610

WATER LEVELS 10' bgs

START 0830 7/25/09

FINISH 0950 7/25/09

LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3.5		0-0.5 No Recovery 0.5-1.5 Peat (Pt), d. brown, moist w/silt & clay, some OM	XRF 2-4' - ND
	4-8	DP-2	3.5		1.5-4 Clayey Sand (SC), d. tan, moist, dense, vfg	XRF 4-6' - Pb = 13
	8-12	DP-3	4		4-9.5 Sand (SP), lt gray, dry, loose-m. dense, trace silt	XRF 6-7' - Pb = 11
10	12-16	DP-4	4		9.5-17.5 SAA w/ more silt, wet	water @ 10' bgs
	16-20	DP-5	4		17.5-19.5 Silty Sand (SM), lt. orange, wet, m. dense, vfg	
					19.5-20 Silty Sand (SM), d. gray, wet, dense, vfg, trace clay	
20					Boring completed @ 20' bgs.	Well construction: 8-18': 1" screen 0-8': 1" PVC casing 7-18': Sand 6-8': Bentonite chips PVC stick up: ~1.5' Sample: CTCA-SB22-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB23

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CIO-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

HA 0 DPT w/Geoprobe S4DT

WATER LEVELS

3.5' bgs

START

1150 7-28-09

FINISH

1205 7-28-09

LOGGER

S. Perille

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DP-1	3		0-1 No Recovery 1-4 Silty Sand (SM), d. gray, moist to wet, m. dense, vfg	KRF 2-3' - NR water @ 3.5' bgs
4-8	4-8	DP-2	3		4-5 No Recovery 5-7 SAA (1-4) 7-8 Silty Sand (SM), d. tan, wet, v. dense - dense, vfg; little clay	
8-10					Boring completed @ 8' bgs	



PROJECT NUMBER

BORING NUMBER

SB24 / TW13

SHEET

OF 1

377812

## SOIL BORING LOG

PROJECT CTD-11 CICA LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 6010 DT  
 WATER LEVELS 7' bgs START 0925 7/24/09 FINISH 1025 7/24/09 LOGGER S Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-1'					No Recovery	
1-3.5	0-4	SP-1	3		Sand w/Clay (SP-SC), gray, dry, v. dense, vfg	XRF 2-4": Zn 299
3.5-6					Sand w/Silt (SP-SM), gray w/orange, dry, loose-m. dense, fg-vfg	XRF 4-6": ND
6-9	4-8	SP-2	4		SAR, lt gray, wet	XRF 6-7": ND water @ 7' bgs
9-9.5	8-12	DP-3	1.5		Silty Sand (SM), black, wet, m. dense, vfg, little clay	
9.5-12					No Recovery	
12-15.5	12-16	DP-4	4		Sand (SP), tan, wet, m. dense, fg, little silt	Sample: CICA-SB24-2-4-09C
15.5-16					Silty Sand (SM), d. gray, wet, v. dense, vfg, trace clay	Well construction info: 5-15': 1" screen 0-5': 1" PVC casing 4-15': Sand 0-4': bentonite chips PVC stick up: ~1.3'
					Boring complete @ 16' bgs	



PROJECT NUMBER

377812

BORING NUMBER

5625

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT

C10-11 C5CA

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACW

DRILLING METHOD AND EQUIPMENT

HA &amp; DPT w/Geoprobe 54DT

WATER LEVELS

START

1320 7/28/09

FINISH

1330 7/28/09

LOGGER

S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS  6"-6"-6" (N)	SOIL DESCRIPTION  SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS  DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-4 Silty Sand (SM), tan, moist, dense, vfg	XRF 2-4': NR
	4-8	DP-2	4		4-8 Sandy Clay (CL), gray w/ orange, moist, v. stiff, vfg	XRF 4-6': NR XRF 6-7': NR
10					Boring completed @ 8' bgs	Sample: [C5CA-5625-6-7-09C]



PROJECT NUMBER

377812

BORING NUMBER

SB26/TW14

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTD-11 CSCALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAEDACLODRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 6610DTWATER LEVELS 11' bgsSTART 1655 7/23/09FINISH 1845 7/24/09LOGGER S Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	1.5			0-2.5 No recovery 2.5-6 Clayey Sand (SC), gray w/orange, moist, m. dense, vfg	XRF 2-4": None detected
5	4-8	DP-2	4		6-8 Sandy Clay (CL), gray w/orange, moist, stiff 8-9.5 No Recovery	XRF 4-6": Pb=30 XRF 6-7": As=13
10	8-12	DP-3	2.5		9.5-12 Sand w/Silt (SP-SM), gray, wet, m. dense, vfg-fg 12-14 No Recovery	water @ 11' bgs
15	12-16	DP-4	2		14-18 SAA (9.5-12) 18-20 Silty Sand (SM), d. gray, wet, m. dense, vfg	Sample: CSCA-SB26-4-T-09C
20	16-20	DP-5	4		Boring completed @ 20' bgs	Well construction: 10-20': 1" screen 0-10': 1" PVC casing 9-20': Sand 8-9': Bentonite chips PVC stickup ~ 1'



PROJECT NUMBER

377812

BORING NUMBER

5827

SHEET

1

OF

1

## SOIL BORING LOG

PROJECT CIO-11 CICA LOCATION Camp Lejeune NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT HA & DEI w/ Geoprobe 541ST  
 WATER LEVELS — START 1340 7/28/09 FINISH 1350 7/28/09 LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DE-1	4		0-3 Silty Sand (SM), gray, moist, dense, vfg. trace clay	XRF 2-4": NR
	4-8	DE-2	4		3-8 Clayey Sand (SC), gray w/orange, moist, v. stiff, vfg, trace silt	XRF 4-6": NR XRF 6-7": NR
10					Boring completed @ 8' bgs	Sample: CICA-5827-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB28/TW15

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CJO-11, CJA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEVACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 6010 DT

WATER LEVELS 10' bgs

START 1415 7/23/09

FINISH 1450

7/23/09

LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-1 Peat (Pt). d. brown, dry, sandy	XRF 2-4: AS: 12, Pb: 17
	1-7				Clayey Sand (SC), gray w/orange, moist, v. dense, vfg	XRF 4-6: None detected
10	4-8	DP-2	4		1-15 Silty Sand (SM), gray, moist, dense, vfg. little clay, percent silt decreases ~ 13'	XRF 6-7: AS: 12
	8-12	DP-3	4		15-17.5 Clayey Sand (SC), d. gray, wet, dense, trace silt	water @ 10' bgs
15	12-16	DP-4	4		17.5-20 Sand w/silt (SP-SM), tan, wet, loose, fg	
	16-20	DP-5	4			Sample CJCA-SB28-2-4-09C
20					Boring completed @ 20' bgs	Well construction: 8-18' 1" screen 0-8' 1" PVC casing 7-18' Sand 6-7' Bentonite chips PVC Stickup: ~ 1.5' ags



PROJECT NUMBER

377812

BORING NUMBER

SB29

SHEET

OF 1

## SOIL BORING LOG

PROJECT C10-11 CSEA

LOCATION

Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT HA : DPT w/Geoprobe 540TWATER LEVELS —START 1400 7/28/09

FINISH

1415 7/28/09

LOGGER

S. Bewick

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DR-1	3		0-1 No Recovery 1-2 Silty Sand (SM), d gray, moist, little orn, loose	XRF 2-4': Pb 15
4-8	4-8	DR-2	4		2-8 Sandy Clay (SC), gray w/orange, moist, v. stiff, v. lg	XRF 4-6': As 9, Zn 20 XRF 6-7': Zn 13
8					Boring completed @ 8' bgs	Sample: CSEA-SB29-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

5630 / TW16

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CJA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe G610 DT

WATER LEVELS 9.5' bgs

START 1205 7/23/09

FINISH 1240 7/23/09

LOGGER S. Greville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF readings in ppm
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DR-1	4		0-1 Peat (Pt). d. brown, dry, sandy, some OM	XRF 2-4': Zn 21, Pb 19
5	4-8	DR-2	4		1-4 Clayey Sand (SC), gray w/orange, dry to moist, v. dense, vfg	XRF 4-6': Zn 19, Pb 20
10	8-12	DR-3	4		4-7.5 Sandy Clay (CL), gray w/orange, moist, v. stiff, trace silt	XRF 6-7': None detected
15	12-16	DR-4	4		7.5-9 Clayey Sand (SC), gray, moist, m. dense, little silt, vfg	water @ 9.5' bgs
					9-16 Sand with Silt (SP-SM), lt gray, wet, m. dense, vfg-fg, color is d. gray @ 14-16'	Sample: CJA 5630-2-7-09C
20					Boring completed @ 16' bgs	Well construction: 7-17': 1" screen 6-17': Sand 0-7': 1" PVC casing 5-6': Bentonite chips PVC stickup ~ 8"



PROJECT NUMBER

377812

BORING NUMBER

5831

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CJA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR JAEVAGLO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/Geo probe

WATER LEVELS

START 0930 7/23/09

FINISH 0950 7/23/09

LOGGER S. Gerwin

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DR-1	4		0-2 Silty Sand (SM), gray w/ orange, dry, dense, vfg, trace clay 2-8 Clayey Sand (SC), gray w/ orange, moist, v. dense, vfg, trace silt - increases depth	XRF 2-4' - None detected  XRF 4-6' - Pb 16  XRF 6-7' - Zn 55
4-8	4-8	DR-2	4		Boring completed @ 8' bgs	Sample: CJA-SB31-4-7-09C CJA-SB31B-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

5632 / TW17

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CTCALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT HA & DPT w/ PowerProbe 9500 VTRWATER LEVELS 11' bgsSTART 1345 7/22/09 FINISH 1345 7/22/09 LOGGER S. Berille

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6'-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	3.5			Ground surface - Pine needles & cleared vegetation 0-1 Peat (Pt), black, dry, sandy, OM 1-7 Clayey Sand (SC), gray w/ orange, dry, v. dense, vfg 7-8 Silty Clay (CL), gray w/ orange, moist, stiff, little sand 8-9 No Recovery 9-11 SRA (7-8') 11-18 Silty Sand (SM), gray, wet, m. dense, trace clay, vfg 18-20 Clayey Sand (SC), d. brown, wet, loose, vfg, little silt	XRF 2-4' : Zn 17, As 40, Pb = ND, Cu = ND XRF 4-6' : Zn 29, As 12, Pb & Cu = ND XRF 6-7' : Zn 65, As, Pb & Cu = ND water @ 11' bgs Sample: CTCA-5632-2-7-09C
4-8	DP-2	4				
8-12	DP-3	3				
12-16	DP-4	4				
16-20	DP-5	4				
20					Boring completed @ 20' bgs	Well construction: 9-19' : 1" screen 8-19' : Sand 7-8' : Bentonite chips 0-9' : 1" PVC casing PVC Stick up ~ 2'



PROJECT NUMBER

377812

BORING NUMBER

5633

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICALOCATION Camp LejeuneELEVATION Not surveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT HA & DPT w/ GeoProbeWATER LEVELS 10' bgsSTART 0320 7/23/09FINISH 0845 7/23/09LOGGER S. Bonville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	DR-1	1.5		Ground surface - pine needles + small trees 0-2.5 No Recovery 2.5-6 Clayey Sand (SC), tan, dry, v. dense, vfg	XRF 2-4': Zn=19 ppm Drilling rate = 4' / 4 min
5	4-8	DR-2	4		6-10 Sandy Clay (CL), gray w/ orange & red, v. stiff, vfg. dry to moist	XRF 4-6': Zn=25 ppm Pb=19 ppm XRF 6-7': Pb=17 ppm Drilling rate = 8' / 10 min
10	8-12	DR-3	4		10-12 Silty Sand (SM), gray, wet, m. dense, vfg	Water @ 10' bgs
15					Boring completed @ 12' bgs.	Sample: CICA-5633-4-6-09C
20						



PROJECT NUMBER

377812

BORING NUMBER

5634

SHEET

OF 1

## SOIL BORING LOG

PROJECT GT-11 CICALOCATION Camp Lejeune, NCELEVATION Not SurveyedDRILLING CONTRACTOR TAEDALCODRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 54DTWATER LEVELS ---START 1025 7/27/09FINISH 1040 7/28/09LOGGER S. Gerville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	SP-1	4		0-2 Silty Sand (SM), gray, moist, m dense, vfg	XRF 2-4: Pb 20
	2-4				2-4 Clayey Sand (SC), gray w/orange, v dense, vfg	XRF 4-6: ND
10	4-8	SP-2	4		4-8 Silty Sand (SM), orange, moist, loose, vfg	XRF 6-7: ND
					Boring completed @ 8' bgs	Sample: <u>CICA-5634-2-4-OAC</u>







PROJECT NUMBER

377812

BORING NUMBER

5B36

SHEET

OF 1

## SOIL BORING LOG

PROJECT CTO-11, CICA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAE DACCO

DRILLING METHOD AND EQUIPMENT H&amp;B DPT w/ Geoprobe 540T

WATER LEVELS 7' bgs START 0905 7/28/09 FINISH 0920 7/28/09 LOGGER S Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6'-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF measurements in ppm
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	0-4	SP-1	4		0-3 Silty Sand (SM), gray, moist, dense, vfg	XRF 2-4' SD
4-8	4-8	SP-2	4		3-4 Clayey Sand (SC), gray w/orange, moist, v. dense, vfg	XRF 4-6' Zn 15, Pb 18
8-10	8-10				4-7 Sandy Clay (CL), gray w/orange, moist, stiff, vfg	XRF 6-7' As 8 water @ 7' bgs
10-12	10-12				7-8 Silty Sand (SM), gray, wet, m. dense, vfg	Sample CICA-S036-4-7-09C
12-14	12-14				Boring completed @ 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

SB37/TW19

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SEADACCO

DRILLING METHOD AND EQUIPMENT

Power Probe 9500 VTR

WATER LEVELS

11.5' bgs

START

7/24/09 0915

FINISH

7/24/09 0945

LOGGER

D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4.5' Silty Sand (SM) Grey/brown, Moist, loose, Medium grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		4.5-5.5' Clayey sand (SC) tan/grey, Moist, medium dense, fine grained	
10	8-12'	DP-3	2'		5.5-8' Sandy Clay (CL) Grey/orange, Moist, Stiff	Water table @ 11.5' bgs
	12-16'	DP-4	2'		8-10' No Recovery 10-10.5' Sandy Clay (CL) Same as 5.5-8'	
15					10.5-11' Clayey sand (SC) Same as 4.5-5.5'	XRF
					11-14' Sand (SP) white with orange streaks Moist, Medium dense, Medium grained. wet at 11.5'	2-4' Pb = 12 PPM Zn = 7 PPM Cu = 17 PPM
20					14-16' No Recovery Driller could not push further with Recovery.	4-6' Pb = 73 PPM Zn = 5 PPM Cu = 12 PPM As = 2 PPM
					End of Boring Log 16'	6-7' Pb = 123 PPM As = 31 PPM Zn = 17 PPM Cu = 43 PPM
					Collected sample CJCA-SB37-6-7-09C @ 0950	Well Construction Set well TW19 using 1" pre packed screen 1 bag of sand Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 6-8' bgs Well set at 18' bgs



PROJECT NUMBER

377812

BORING NUMBER

SB38

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Powerprobe 9500 VTR

WATER LEVELS

NA

START 7/24/09 0845

FINISH 7/24/09 0850

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
S	0-4'	DP-1	2'		0-2' No Recovery 2-3' Silty sand (SM) Black, moist, loose, medium grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		3-5.5' Clayey sand (SC) light grey/orange, moist, medium dense, fine grained 5.5-8' Sandy clay (CL) light grey with orange streaks, moist, stiff	
					End of Boring 8'	Collected sample CJCA-SB38-2-4-09C @0850
						XRF 2-4' Pb = 173 PPM Zn = 105 PPM As = 10 PPM Cu = 79 PPM
						4-6' Pb = 73 PPM Zn = 21 PPM As = 12 PPM Cu = 23 PPM
						6-7' Pb = 30 PPM Zn = 18 PPM As = 2 PPM Cu = 17 PPM



PROJECT NUMBER

377812

BORING NUMBER

SB 39/TW 20

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO - 011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Powerprobe 9500 UTR

WATER LEVELS

10' bgs

START 7/23/09 1640

FINISH 7/23/09 1700

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-0.5' Silty Sand (SM) brown/black, moist, medium dense, medium grained	Hand Auger Cleared 0-5' bgs.
					0.5-1.5' clayey sand (SC) light grey/orange, moist, dense, fine grained	
	4-8'	DP-2	4'		1.5-7' Sandy clay (CL) grey/black, moist, stiff	Water table @ 10' bgs
					7-8' clayey sand (SC) light grey/white, moist, medium dense, medium grained.	
10	8-12'	DP-3	4'		8-12' Silty Sand (SM) white/grey, moist, loose, medium grained. wet @ 10'	XRF 2-4' Pb=7PPM As=1PPM Zn=12PPM 4-6' Pb=3PPM As=2PPM Cu=12PPM 6-7' Cu=15PPM Pb=2PPM
					12-13' No Recovery	
					13-14' clayey sand (SC) white/grey, wet, stiff	
15	12-16'	DP-4	3'		14-16' Sand (SP) Grey, wet, loose, medium grained.	Well Construction For CICA-TW 20 well set at 17' bgs Using 1" pre packed screen Screen: 7-17' bgs Sand: 6.5-17' bgs Bentonite: 4.5-6.5' bgs Used 1 bag of sand.
					Collected sample CICA-SB39-2-4-09C @ 1700	



PROJECT NUMBER

377812

BORING NUMBER

5840

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DIT w/ Geoprobe 54DT

WATER LEVELS

START 0835 7/28/09

FINISH 0850 7/29/09

LOGGER S. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF measurements in ppm
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-2 Clayey Sand (SC), gray, moist, dense, vfg	XRF 2-4: ND
	4-8	DP-2	4		2-7 Sandy Clay (CL), gray, w/orange, moist, stiff, vfg 7-8 Silty Clay (CL), gray, moist, m. stiff, trace sand	XRF 4-6: Zn 19, Pb 14 XRF 6-7: Zn 14, Pb 23
10					Boring completed @ 8' bgs	Sample: CICA-3040-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB41/TW21

SHEET

OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Powerprobe 95cc VTR

WATER LEVELS

10.5' bgs

START

7/23/09 1500

FINISH

7/23/09 1535

LOGGER

D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) brown/black, moist, medium dense, medium grained.	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		2-5' clayey sand (SC) light grey/moist, dense, medium grained.	
	8-12'	DP-3	4'		5-9' Sandy clay (CL) grey/orange, moist, stiff	Water table @ 10.5' bgs
	12-16'	DP-4	4'		9-11' clayey sand (SC) grey/white, moist, dense, medium grained 11-16' silty sand (SM) grey/white, wet, loose, medium grained.	
15						<p><u>KRF</u></p> <p>2-4' Pb= 3 PPM As= 1 PPM Cu= 10 PPM</p> <p>4-6' Pb= 10 PPM As= 4 PPM Cu= 17 PPM Zn= 12 PPM</p> <p>6-7' Pb= 3 PPM As= 4 PPM Zn= 11 PPM Cu= 7 PPM</p>
					Collect Sample CJCA-SB41-4-6-09C @ 1525	Well Construction Details Used 1" Pre Packed Screen screen; 6-16' bgs Sand; 6-16' bgs Bentonite; 4.5-6' bgs used 1 bag of sand



PROJECT NUMBER

377812

BORING NUMBER

5642

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 C3CA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SREDALCO

DRILLING METHOD AND EQUIPMENT HA = DPT w/ Geoprobe 54DT

WATER LEVELS

START 0815 7/23/09

FINISH 0830 7/29/09

LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	W-1	3.5		0-0.5 No Recovery 0.5-4 Clayey Sand (SC), gray, dry, v. dense, vfg	XRF 2-4' Pb 18
	4-8	W-2	4		4-8 Clay (CL), gray w/orange, moist, v. stiff, trace silt & sand	XRF 4-6' Zn 25, Pb 19 XRF 6-7' Zn 26, Pb 22
10					Boring completed @ 8' bgs	Sample: C3CA-5642-2-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB43/TW22

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CT0-11 CTCA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ PowerProbe 9500- VTR

WATER LEVELS 13' bgs

START 1555 7/22/09 FINISH 1655 7/22/09 LOGGER S. Benille

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		Ground surface - small vegetation 0-1 No recovery 1-4 Sand (SP), tan, dry, v. dense, vfg-fg	XRF measurements in pps
	4-8	DP-2	4		4-11 Sandy Clay (CL), gray w/ orange, moist, v. stiff, sand content decreases w/ depth	XRF 2-4': Zn 18 XRF 4-6': Zn 27
	8-12	DP-3	4		11-13 Silty Clay (CL), tan, wet, m. stiff, some sand	XRF 6-7': Zn 18, Pb 17 Sample: CTCA-SB43 6-7' 09C
15	12-16	DP-4	4		13-15 Silty Sand (SM), gray, wet, m. dense, vfg 15-17 Silty Sand (SM), black, wet, dense, little clay, some wood fragments	water @ 13' bgs
	16-20	DP-5	4		17-20 Clayey Sand (SC), d. gray, wet, little silt, loose	
	20-22	DP-6	2		20-22 Sand w/ Silt (SP-SM), gray, wet, loose, vfg	
					Boring completed @ 22' bgs	



PROJECT NUMBER

377812

BORING NUMBER

SB44

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 C3CA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA - DPT w/Geo probe

WATER LEVELS 7.5' bgs

START 0905 7/23/09 FINISH 0920 7/23/09 LOGGER J Deville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	2.5			0-1.5 No Recovery 1.5-4 Silty Sand (SM), d. gray, moist, dense-v. dense, vfg, little clay	XRF 2-4'-None detected
4-8	DP-2	4			4-7.5 Silty Clay (CL), gray w/ orange moist, vfg, trace sand 7.5-8 Silty Sand (SM), gray, wet, vfg, m. dense	XRF 4-6'-None detected XRF 6-7'-Pb 22, Zn 22
					Boring completed @ 8' bgs	Sample: C3CA-SB44-6-7-09C



PROJECT NUMBER

377812

BORING NUMBER

56451 TW23

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACLO

DRILLING METHOD AND EQUIPMENT HA + DPT w/Power Probe 9500

WATER LEVELS 5' bgs

START 1435 7/22/09

FINISH 1500 7/22/09

LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
	0-4	DP-1	2.5		Ground Surface - Pine needles, debris from veg clearance	XRF measurements in ppm
					0-1.5 No Recovery	XRF 2-4": Zn 21, Pb 17
5	4-8	DP-2			1.5-4 Clayey Sand (SC), gray w/orange, dry, v. dense, vfg	
			3		4-5 No Recovery	XRF 4-5": Zn 36, Pb 14
10	8-12	DP-3			5-10 Silty Sand (SM), lt gray, wet, m. dense, vfg-fg	
					10.5-12 Sand w/clay (SP-SC), gray, wet, dense, vfg-fg	
15					Boring complete @ 12' bgs	
20						



PROJECT NUMBER

377812

BORING NUMBER

5846

SHEET

1

OF

## SOIL BORING LOG

PROJECT GT-11 CJALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 54DTWATER LEVELS —START 1510 7/27/09 FINISH 1525 7/27/09 LOGGER S. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	Dr-1	3	6"-6"-6" (N)	0-1 No Recovery 1-4 Clayey Sand (SC), gray w/orange, moist, v. dense, afg	REF 2-4": ND
	4-8	Dr-2	4		4-7.5 SAA 7.5-8 Sand (SP), lt gray, moist, m. dense, afg, little silt	REF 4-6": Zn 18, As 18 REF 6-7": Pb 15
10					Boring completed @ 8' bgs	Sample: CJA-5846-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB47/TW24

SHEET

OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

PowerProbe 9500 VTR

WATER LEVELS

8' bgs

START 7/25/09 1005

FINISH 7/25/09 1015

LOGGER D. Brown / CL7

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' Clayey sand (SC) grey/black, moist, loose, medium grained	Hand Auger Cleared 0-5' bgs Wet @ 8' bgs
	4-8'	DP-2	4'		4-8' Sandy clay (CL) grey/orange, moist, stiff 8-12' Sand (SP) light grey/black, wet, loose, medium grained.	XRF 2-4' Pb=7ppm As=2ppm Cu=13ppm Zn=11ppm
10	8-12'	DP-3	4'		End of boring @ 12' bgs	4-6' Pb=20ppm Cu=7ppm Zn=15ppm 6-7' Pb=21ppm As=3ppm Cu=17ppm Zn=7ppm
						Collected sample CTCA-SB47-6-7-09C @ 1010
						Well construction details Screen: 6-16' bgs Sand: 5.5-16' bgs Bentonite: 4-5.5' bgs 1/2 bag #2 sand 1" pre-packed screen
						Driller could not drill past 12' bgs.



PROJECT NUMBER

377812

BORING NUMBER

3848

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CJO-11, CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SREDACCO

DRILLING METHOD AND EQUIPMENT HR &amp; DPT w/ Geoprobe S4BT

WATER LEVELS

START 1540 7/27/09

FINISH 1600 7/27/09

LOGGER S. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-3.5 Silty Sand (SM), orange-tan, moist, loose, fg-vfg	XRF 2-4' : ND
	4-8	DP-2	4		3.5-8 Sandy Clay (CL), gray w/orange, moist, stiff, vfg	XRF 4-6' : Zn 20, As 11 XRF 6-7' : Zn 14
10					Boring completed @ 8' bgs	Sample CICA-3848-4-6-09C



PROJECT NUMBER 377812	BORING NUMBER SB49/TW25	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 12' bgs START 7/25/09 1505 FINISH 7/25/09 1600 LOGGER D. Brown/C.L.T.

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) brown/black, moist loose, medium grained	0-5' bgs Cleared by Hand Auger.
	4-8'	DP-2	4'		2-3' clayey sand (SC) light grey/orange, moist, medium dense, fine grained.	
10	8-12'	DP-3	3'		3-4.5' sandy clay (CL) light grey, moist, stiff 4.5-5.0' clayey sand (SC) same as 2-3'	Water @ 12' bgs  XRF 2-4' Pb=5PPM Cu=12 PPM 4-6' Nothing 6-7' Nothing
	12-16'	DP-4	3'		5-8' sandy clay (CL) same as 3-4.5' 8-9' No Recovery 9-12' Sand (SP) light grey, moist, loose, medium grained,	
15					12-13' No Recovery 13-16' same as 9-12' but wet.	Collect sample <u>CJCA-SB49-2-4-09C</u> @1600  Contractor could not drill past 16' bgs.
					16' bgs End of boring	
						Well construction details Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs Well Set at 18' bgs 1" Pre-packed Screen 1/2 bag #2 sand



PROJECT NUMBER

377812

BORING NUMBER

5850

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CTO-11, CSEA LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 545T  
 WATER LEVELS 7.5' bgs START 6:10 7/27/09 FINISH 16:20 7/27/09 LOGGER S. Gerille

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-4 Silty Sand (SM), gray, moist, m. dense, vfg, trace clay	XRF 2-4" : ND
	4-8	DP-2	4		4-7.5 Sandy Clay (CL), gray w/orange, moist, stiff, vfg 7.5-8 Sand (SP), gray, wet, dense, little silt, vfg	XRF 4-6 : Pb13 XRF 6-7" : ND
10					Boring completed @ 8' bgs	Sample: CSEA-5850-4-6-09E



PROJECT NUMBER 377812	BORING NUMBER SBS1/TW26	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 7' bgs START 7/25/09 1130 FINISH 7/25/09 1145 LOGGER D. Brown / C.L.T.

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) black/brown, moist, medium dense, medium grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	3'		1.5-2' clayey sand (SC) grey/orange, moist, dense, fine grained	
	8-12'	DP-3	4'		2'-4' sandy clay (CL) grey with orange streaks, moist, stiff	Water table @ 7'
10					4-5' No Recovery 5-6' same as 2-4'	Driller could not drill past 12' bgs.
					6-7' same as 1.5-2'	
					7-8' Sand (SP) grey, wet, loose, medium grained	Collected sample <u>ICJCA-SBS1-2-7-09C</u>
					8-9' clayey sand (SC) grey, wet, stiff	XRF 2-4' Pb=17ppm Cu=3ppm As=1ppm
					9-12' Silty sand (SM) light grey, wet, loose, medium grained	4-6' Pb=13ppm As=2ppm Zn=15ppm
					12' end of boring	6-7' Pb=14ppm As=3ppm Cu=11ppm
						Construction Details 1" pre-packed screen 1/2 bag #2 sand Screen: 6-16' bgs Sand: 5.5-16' bgs bentonite: 4.5-5.5' bgs well set at 16' bgs



PROJECT NUMBER

377812

BORING NUMBER

SB52

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTD-11 CICA LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACIO  
 DRILLING METHOD AND EQUIPMENT HA & DPT w/Geoprobe 54DT  
 WATER LEVELS                      START 1630 7/27/09 FINISH 1645, 7/27/09 LOGGER S. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	3			0-1 No Recovery 1-6 Silty Sand (SM), gray, moist, m. dense, vfg	XRF 2-4' : ND
4-8	DP-2	4			6-8 Clayey Sand (SC), gray w/orange, moist, dense, vfg	XRF 4-6' : Pb 13 XRF 6-7' : Pb 12
8-10					Boring completed @ 8' bgs	Sample: CICA-SB52-4-6-09C



PROJECT NUMBER

377812

BORING NUMBER

SB53/TW27

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 CICA

LOCATION

Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR

JAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/PowerProbe

WATER LEVELS 11.5' bgs

START 0900 7/22/09

FINISH 0950 7/22/09

LOGGER B. Berilla

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-4	DP-1	2.5			Ground surface pine needles, peat 0-1.5 No Recovery 1.5-4 Clayey Sand (SC), dry, v. dense, tan, vfg, trace silt	Drilling rate: 4'/15 min XRF 2-4' None detected
4-8	DP-2	3.5			4-4.5 No Recovery 4.5-10 Sandy Clay (CL), gray w/ orange moist, v. stiff, vfg	XRF 4-6' None detected XRF 6-7' None detected
8-12	DP-3	3.5			10-14 Silty Sand (SM), gray, moist to wet.	Drilling rate: 16'/20 min water @ 11.5' bgs
12-16	DP-4	4			14-18 SAR, d. gray, wet. Wood Fragments @ 15-15.2'	
16-20	DP-5	3			18-20 Clayey Sand (SC), d. gray, wet, m. dense, vfg	Drilling rate: 20'/35 min
					Boring completed @ 20' bgs	Well construction: 10-20' 1" screen 8-20' Sand 7-8' Bentonite 2' ags-10' 1" PVC casing Sample (composite): CICA-SB53-2-7-09C for Select metals, pH



PROJECT NUMBER

377812

BORING NUMBER

SB 54

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO - 011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Geoprobe DPT 540T

WATER LEVELS

7.5' bgs

START 7/22/09 1035

FINISH 7/22/09 1050

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-1' Silty sand (SM) Brown, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs.
	4-8'	DP-2	4'		1-4' Clayey Sand (SC) orange/tan, moist, dense, fine grained	
10	8-12'	DP-3	4'		4-7.5' Sandy clay (CL) orange/grey, moist, stiff	Water table @ 7.5'
15					7.5'-12' clayey sand (SC) grey with orange streaks, wet, very dense, fine grained.	XRF 2-4' Pb=19 ppm Cu=25 ppm Zn=6 ppm As=1 ppm
					End of boring 12' bgs	4-6' Pb=18 ppm As=7 ppm Cu=15 ppm Zn=11 ppm
						6-7' Pb=32 ppm Cu=66 ppm Zn=11 ppm
						Collected samples CTCA-SB54-6-7-09C CTCA-SB54-6-7-09C-MS CTCA-SB54-6-7-09C-SD @ 1050



PROJECT NUMBER 377812	BORING NUMBER SB 55	SHEET 1 OF 1
SOIL BORING LOG		

PROJECT CTO - 011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Geoprobe DPT 54 DT  
 WATER LEVELS 5' bgs START 7/22/09 1000 FINISH 7/22/09 1020 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' Silty clay (CL) orange/grey, moist, stiff	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		4-7' clayey sand (SC) grey, moist, medium dense, very fine grained, wet at 5'	water table @ 5' bgs
10	8-12'	DP-3	4'		7-8' sandy silt (ML) grey, wet, stiff 8-12' Silty clay (CL) orange/grey, moist, stiff	Collected sample CJCA-SB55-4-6-09C @ 1020
15					End of boring 12'	XRF Readings 2-4' Pb = 13 ppm Zn = 28 ppm Cu = 4 ppm 4-6' Pb = 56 ppm Zn = 16 ppm 6-7' Pb = 14 ppm As = 1 ppm Cu = 13 ppm Zn = 13 ppm



PROJECT NUMBER

377812

BORING NUMBER

5B56

SHEET 1

OF 1

## SOIL BORING LOG

PROJECT CIO-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 54DT

WATER LEVELS

START 1250 7/27/09

FINISH 1250 7/27/09

LOGGER S Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
0-1	0-4	DR-1	3		0-1 No Recovery	XRF measurements in ppm XRF 2-4' : Pb 19 XRF 4-6' : Zn 22 XRF 6-7' : Zn 85, As 11
1-3					1-3 Silty Sand (SM), gray, moist, dense, vfg	
3-5.5					3-5.5 Clayey Sand (SC), gray w/orange, moist, v.dense, vfg	
5	4-8	DR-2	4		5.5-8 Sandy Clay (CL), gray w/orange, moist, stiff, vfg	
10					Boring completed to 8' bog	Sample: CICA-5B56-2-7-09c



PROJECT NUMBER <b>377812</b>	BORING NUMBER <b>SB 57/TW 29</b>	SHEET <b>1</b>	OF <b>1</b>
<b>SOIL BORING LOG</b>			

PROJECT CTO - 011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Power Probe 9500 VTR  
 WATER LEVELS 10' bgs START 7/23/09 1145 FINISH 7/23/09 1220 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-3' Silty sand (SM) brown/black, moist, medium dense, medium grained.	0-5' Cleared with hand Auger.
	4-8'	DP-2	4'		3-4.5' Clayey sand (SC) light grey/white, moist, dense, medium grained	
10	8-12'	DP-3	4'		4.5-10' Sandy clay (CL) light grey/white, orange streaks present, moist, stiff	Water Table @ 10' bgs  XRF 4-6' Pb = 21 PPM Zn = 25 PPM
	12-16'	DP-4	4'		10-11' Clayey sand (SC) light grey/white, wet, dense, medium grained.	
15					11-16' Silty sand (SM) orange/grey, wet, loose medium grained.	2-4' Pb = 1722 PPM Zn = 783 PPM Cu = 1415 PPM As = 372 PPM 6-7' Pb = 607 PPM Zn = 208 PPM  Construction Details: 1" Prepacked screen. 1 bag of sand. screen: 6-16' bgs Sand: 6-16' bgs bentonite: 4.5-6' bgs  CJCA-TW 29 set 16 ft. bgs
					Collected sample CJCA-SB57-2-4-09C @ 1230	



PROJECT NUMBER

377812

BORING NUMBER

S658

SHEET

OF

## SOIL BORING LOG

PROJECT CTO-11 CJCA LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT NA & DPT w/ Geoprobe 54 BT  
 WATER LEVELS - START 1150 7/27/09 FINISH 1205 7/27/09 LOGGER S. Deville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
	0-4	DP-1	4		0-1 Peat (Pt), d brown, moist, Sandy & silty, some OM.	XRF measurements in ppm
5					1-4 Silty Sand (SM), gray, moist, dense, vfg	XRF 2-4" Zn 16, As 7
	4-8	DP-2	4		4-8 Sandy Clay (CL), gray w/ orange, v. stiff, moist, vfg	XRF 4-6" Zn 16, As 12
10					Boring completed @ 8' bgs	XRF 6-7" - ND
						Sample: CJCA-S658-2-6-09C



PROJECT NUMBER <b>377812</b>	BORING NUMBER <b>SBS9/TW30</b>	SHEET <b>1</b>	OF <b>1</b>
<b>SOIL BORING LOG</b>			

PROJECT CTC-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 11' bgs START 7/23/09 1335 FINISH 7/23/09 1350 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' Silty sand (SM) Brown/grey, Moist, loose Medium grained	Cleared 0-5' bgs with Hand Auger  Water table @ 11' bgs
	4-8'	DP-2	4'		2-2.5' clayey sand (SC) light grey/moist, medium dense, medium grained	
	8-12'	DP-3	4'		2.5-9.5' sandy clay (CL) light grey with orange streaks, moist, stiff	
	12-16'	DP-4	4'		9.5-10.5 clayey sand (SC) same as 2-2.5'	
15					10.5-12.5' sand (SP) grey/white, moist, loose, medium grained wet at 11'	<u>XRF</u> 2-4' Pb = 41 PPM Zn = 15 PPM Cu = 23 PPM As = 10 PPM  4-6' Pb = 32 PPM Zn = 17 PPM As = 2 PPM Cu = 21 PPM  6-7' Pb = 13 PPM Zn = 3 PPM Cu = 16 PPM
					12.5-13.0' sandy clay (CL) same as 2.5'-9.5'	
					13-16' Sand (SP) grey/dark brown, wet, loose, medium grained	
					Collected sample CJCA-SBS9-2-4-09C @ 1350 CJCA-SBS9D-2-4-09C @ 1355	<u>Construction Details</u> Set well TW30 @ 16' bgs Use 1" pre packed screen Sand: 5.5-16' bgs Screen: 6-16' bgs Bentonite: 4-5.5' bgs Set well @ 1400



PROJECT NUMBER

377812

BORING NUMBER

SB60

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Geoprobe DPT 540T

WATER LEVELS

9' bgs

START

7/22/09 1430

FINISH

7/22/09 1445

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-1.5' Silty Sand (SM) Brown, moist, loose, dense, fine grained	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		1.5'-4' Clayey Sand (SC) grey with orange streaks, moist, dense, fine grained	
10	8-12'	DP-3	4'		4-9' Sandy Clay (CL) Grey/tan, moist, stiff orange staining at 7'	
15					9-10' Silty Sand (SM) Grey/orange, wet, loose, medium dense, fine grained	Water table observed at 9'
					10-12' Poorly Graded Sand (SP) Grey/tan, wet, loose, medium dense, medium grained.	XRF 2-4' Pb=15 PPM 4-6' Th=18 PPM 6-7' No Detections
					End of boring 12'	Collected Sample CJCA-SB60-4-6-09C @1445



PROJECT NUMBER

377812

BORING NUMBER

SB61/TW31

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Geoprobe DPT 540T

WATER LEVELS

11' bgs

START

7/22/09 0910

FINISH

7/22/09 0930

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-5' silty sand (SM) Black, moist, loose, medium grained	Cleared 0-5' bgs with Hand Auger.
	4-8'	DP-2	3'		5-6' No Recovery 6-8' silty clay (CL) Black/grey, moist, stiff	
	8-12'	DP-3	1'		8-11' No Recovery 11-12' silty sand (SM) Black, wet, loose, medium grained	
10						Wet @ 11' bgs
15						XRF Readings 2-4' Pb = 20 PPM Zn = 18 PPM
						4-6' Pb = 6 PPM Zn = 14 PPM Cu = 5 PPM
						6-7' Pb = 6 PPM As = 1 PPM Zn = 5 PPM Cu = 25 PPM
					End of boring 12' bgs	Collected sample CTCA-SB61-2-4-09C @ 0930



PROJECT NUMBER

377812

BORING NUMBER

SB62

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO - oil

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Geoprobe DPT 540T

WATER LEVELS

7.5' bgs

START

7/22/09 1300

FINISH

7/22/09 1320

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' Silty Sand (SM) Brown, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	3'		2-4' Clayey Sand (SC) orange/tan, moist, dense, fine grained	
	8-12'	DP-3	4'		4-5' No Recovery 5-7' Sandy clay (CL) orange/grey, moist, stiff	
10					7-10' Silty Sand (SM) orange/grey, moist, medium dense, medium grained, Wet at 7.5' bgs	XRF 6-7' - No Detections 4-6' - No Detections 24' - Pb 17ppm
15					8-12' same as 5-7'	
					End of boring 12'	Collected Sample CJCA-SB62-2-4-09C ① 1320







## SOIL BORING LOG

PROJECT CFO-11 CSCALOCATION Camp Lejeune, NCELEVATION Not surveyedDRILLING CONTRACTOR SAE DACCIODRILLING METHOD AND EQUIPMENT HA & DPT w/ Geoprobe 540TWATER LEVELS                     START 1045 7/27/09FINISH 1100 7/27/09LOGGER J. Beville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION XRF measurements in ppm
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4		0-3.5 Silty Sand (SM), gray, moist, m. dense, vfg, little clay	XRF 2-4' : ND
	4-8	DP-2	4		3.5-8 Sandy Clay (CL), gray w/orange, moist, stiff to v. stiff, vfg	XRF 4-6' : Zn=23, Pb=16 XRF 6-7' : As=25
10					Boring completed @ 8' bgs	Sample: CSCA-SB64-4-7-09C CSCA-SB64D-4-7-09C



PROJECT NUMBER

377812

BORING NUMBER

SB65/TW33 SHEET 1 OF 1

## SOIL BORING LOG

PROJECT CTO-011

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT Geoprobe DPT 540T

WATER LEVELS 11.5' bgs

START 7/22/09 1650

FINISH 7/22/09 1715

LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3.5'		0-0.5' No Recovery 0.5-1.5' Silty sand (SM) Black/brown, moist, medium dense, fine grained.	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		1.5-4.5' Clayey Sand (SC) Grey with orange streaks Moist, dense, very fine grained.	
	8-12'	DP-3	4'		4.5-9.5' Sandy clay (CL) grey/tan, moist, very stiff	Water table at 11.5' bgs
	12-16'	DP-4	4'		9.5-16' Sand (SP) grey/white, moist, loose, medium grained Partly graded	XRF 2-4' Pb = 1448 ppm Zn = 3927 ppm Cu = 7944 ppm
15					10' - orange 11' - black 11.5' - wet 12' - orange 13' - black	4-6' - No Detections 6-7' - No Detections
					End of Boring 16'	
					Set CJCA-TW33 on 7/23/09 @ 0910.	Collected sample CJCA-SB65-2-4-09C @ 1715
					1" Prepacked Screen: 6-16' bgs Sand: 6-16' bgs Bentonite: 5-6' bgs	



PROJECT NUMBER

377812

BORING NUMBER

SB66

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Geoprobe DPT 540T

WATER LEVELS

11.5' bgs

START

7/22/09 1550

FINISH

7/22/09 1630

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-4.5' Silty sand (SM) Black, moist, medium dense, fine grained	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		4.5-10.5' sandy clay (CL) grey/tan with orange streaks, moist, stiff	1600- Driller loses spring on drill rig. 1615- Driller resumes Drilling
10	8-12'	DP-3	4'		10.5-13' silty sand (SM) grey/brown, moist, medium dense, medium grained. wet at 11.5'	Water table @ 11.5' bgs
15	12-16'	DP-4	4'		13'-16' Poorly Graded Sand (SP) grey/brown, wet, medium dense, medium grained	XRF 2-4' 16 Detections 6-7' No Detections 4-6' Pb = 1475 PPM As = 2107 PPM Zn = 3748 PPM Cu = 7389 PPM
					End of boring 16'	Collected sample CJCA-SB66-4-6-09C @ 1630



PROJECT NUMBER 377812	BORING NUMBER SB67/TW34	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Geoprobe DPT 540T  
 WATER LEVELS 10' bgs START 7/22/09 1515 FINISH 7/22/09 1545 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-3' Silty Sand (SM) brown/black, moist, medium dense, fine grained grey/tan at 1.5'	0-5' Cleared by Hand Auger
	4-8'	DP-2	4'		3-5.5' Clayey Sand (SC) grey with orange streaks, moist, dense, fine grained	
	8-12'	DP-3	4'		5.5-10' Sandy Clay (CL) grey/tan, moist, stiff	Water table @ 10' bgs
	12-16'	DP-4	4'		10-13' Silty Sand (SM) grey with orange streaks moist, loose, medium dense. wet at 11.5'	
15					13-16' Poorly Graded Sand (SP) grey/orange, wet, medium dense, medium grained	XRF 2-4' No Detections 4-6' No Detections 6-7' Pb = 1435 PPM As = 2415 PPM Cu = 8073 PPM Zn = 4205 PPM
					End of boring 16'	Collected sample
					set CJCA-TW34 Screen: 6-16' bgs Sand: 6-16' bgs 1 50-lb bag Bentonite: 5-6' bgs 1 50 lb bag of Sand was used.	CJCA-SB67-6-7-09C @ 1545 TW34 set with bottom of screen 16' bgs Well set on 7/23/09 @ 845. 10' prepacked screen was used.



PROJECT NUMBER

377812

BORING NUMBER

SB68

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-011

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT Geoprobe DPT 540T

WATER LEVELS 10' bgs

START 7/22/09 1400

FINISH 7/22/09 1420

LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-1.5' Silty Sand (SM) Brown, moist, loose, medium grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		1.5-3.5' Clayey Sand (SC) Grey with orange streaks, moist, medium dense, fine grained.	
10	8-12'	DP-3	4'		3.5'-6.0' Sandy clay (CL) grey/tan, moist, very stiff	
					6-6.5' silty sand (SM) grey/tan, moist, loose, fine grained.	Water table @ 10' bgs
15					6.5-10' Sandy clay (CL) Same as 3.5-6.0'	
					10-12' Silty Sand (SM) Grey, wet, dense, medium grained	XRF 2-4' No Detections 4-6' AS = 11 PPM 6-8' No Detections
					End of boring 12'	Collected sample CJCA-SB68-24-09C



PROJECT NUMBER

377812

BORING NUMBER

5869/TW35

SHEET

OF 1

## SOIL BORING LOG

PROJECT

CTO-11

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SADEACCO

DRILLING METHOD AND EQUIPMENT

DPT Geoprobe 540T

WATER LEVELS

10' bgs

START

7/21/09 1605

FINISH

7/21/09 1630

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3.5'		0-0.5' No Recovery 0.5-2' silty sand (SM) Brown/orange, moist, medium dense, very fine grained sand	Hand Auger Cleared 0-5' bgs.
	4-8'	DP-2	4'		2-4' Inorganic Silt (ML) orange/grey, moist, medium stiff	
	8-12'	DP-3	4'		4'-11' Clayey Sand (SC) orange/tan, moist, medium dense, fine grained.	Water at 10' bgs
15	12-16'	DP-4	4'		11-16' Silty Sand (SM) orange/gray, wet, loose, medium grained.	XRF 2-4' Pb = 8 ppm As = 8 ppm Cu = 1 ppm 4-6' Pb = 5 ppm As = 15 ppm Cu = 1 ppm 6-7' Pb = 9 ppm As = 15 ppm Cu = 10 ppm Zn = 57 ppm
					16' End of boring	Collected Sample CTCA-5869-6-7-09C @ 1640.



PROJECT NUMBER

377812

BORING NUMBER

SB 70

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT Geoprobe DPT 540T

WATER LEVELS 9' bgs

START 7/22/09 1330

FINISH 7/22/09 1350

LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	4'		0-2' silty sand (SM) Brown, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		2-4' clayey sand (SC) grey/orange, moist medium dense, fine grained	
10	8-12'	DP-3	4'		4-9' sandy clay (CL) Grey with orange streaks, moist, very stiff	
15					9-12' silty sand (SM) grey, wet, dense, medium grained	water table @ 9' bgs
					End of boring 12'	
						XRF 2-4' Fe=17,000 ppm 4-6' No detections 6-7' Pb=16 ppm
						Collected sample CJCA-SB70-2-4-09C @ 1350
						duplicate collected sample CJCA-SB700-2-4-09C @ 1355



PROJECT NUMBER

377812

BORING NUMBER

SB71/TW36

SHEET

OF 1

## SOIL BORING LOG

PROJECT

Camp Johnson

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDECCO

DRILLING METHOD AND EQUIPMENT

Hand Auger and DPT with Geoprobe S4BT and Powerprobe 9500

WATER LEVELS

9' bgs

START

7/21/09 0930

FINISH

7/21/09 1010

LOGGER

D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4'		0-2' Silty Sand (SM) Black, Moist, medium dense	Cleared 0-5' with hand Auger
					2-5' Clayey sand (SC) Tan, Moist, Dense, Fine grained.	
	4-8	DP-2	4'		5-8' Silty Clay (CL) Tan, Moist, Stiff, trace sand.	
					8-9' silty clay (CL) Tan/black moist, very stiff, trace sand	
10	8-12	DP-3	4'		9-10' clayey silt (ML) Tan, wet, very stiff,	Water at 9'
15	12-16	DP-4	4'		10-16' Poorly graded sand with silt (SP-SM) Grey/white, wet, medium dense, medium grained.	
					14' - color change Dark Brown	Installed TW36, Screen set at 16', Top of screen at 6'
20					End of boring - 16'	
						Collected sample CJA-SB71-6-7-09C at 1010.
						XRF measurements 6-7'
						Pb = 20 PPM
						Zn = 15 PPM
						Cu = 39 PPM



PROJECT NUMBER

377812

BORING NUMBER

SB72

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT C-10-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAE0A LLC

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ PowerProbe 9500

WATER LEVELS 9.5' bgs

START 7/21/09 1455

FINISH 7/21/09 1520

LOGGER J. Gerville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
	0-4	DP-1	2.5		0-0.5 Peat (Pt), d. brown, dry, loose, sandy, w/OM 0.5-2 No Recovery	XRF 2-4 - No hits
	4-8	DP-2	3.5		2-2.5 Sand w/ silt (SP-SM), gray, dry, loose, vfg 2.5-4 Clayey Sand (SC), gray w/orange, dry, v. dense, vfg 4-4.5 No recovery	XRF 4-6 - Pb: 14 ppm, Zn: 20 Cu: 17 XRF 6-7 - Pb: 9, As: 10, Zn: 13 Cu: 4
	8-12	DP-3	2.7		4.5-8 Sandy Clay (CL), gray w/orange, moist, v. stiff 8-9.3 No Recovery 9.3-9.7 Silty Clay (CL), gray, wet, soft, vfg 9.7-12 Sand (SP), lt gray w/ orange, wet, m. dense, vfg Boring completed @ 12' bgs	water @ 9.5' bgs  Sample: CICA-SB72-4-6-09C



## SOIL BORING LOG

PROJECT CTA-11- CICA

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SREDACCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe

WATER LEVELS 9' bgs

START 7/21/09 10:10 FINISH 7/21/09 10:40 LOGGER S. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DR-1	4'		0-1 Peat (Pt), black, dry, loose, OM present, sand and silt present	XRF 2-4' : Not recorded
	4-8	DR-2	4'		1-1.3 Silty Sand (SM), gray, dry, m. dense, vfg, trace clay	XRF 4-6' Pb: 19 ppm, Zn: 9 ppm <del>Fe: 540 ppm</del>
					1.3-4.5 Clayey Sand (SC), gray w/ orange streaks, dry to moist, v. dense, vfg	XRF 6-7' : Not recorded
					4.5-9 Sandy Clay (CL), gray w/ orange, moist, stiff	water @ 9' bgs
10	8-12	DR-3	4'		9-10 Sandy Clay (CL), gray w/ orange, wet, soft, some silt	Sample: CICA-SB73-4-6-09C
15	12-15	DR-4	3'		10-13.5 Silty Sand (SM), gray, wet, m. dense, vfg, trace clay	
					13.5-15 SAA, d. gray	
					Boring complete @ 15' bgs	Well construction info: 5-15' bgs 1" screen 0-4' bgs Bentonite chips 4-15' bgs Sand 2.5' ags - 5' bgs: 1" PVC casing



PROJECT NUMBER

377812

BORING NUMBER

SB74

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-11 CTCA

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

DPT GeoProbe 54 DT

WATER LEVELS

12.5' bgs

START

7/21/09 1115

FINISH

7/21/09 1215

LOGGER

D. Brown / CCI

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3'		0-1' No Recovery 1-4' well graded sand with silt (SW-SM) light brown/orange, moist, loose, fine grained	Cleared 0-5' with Hand Auger.
	4-8	DP-2	11'		4-6' Clayey sand (SC) orange, moist, medium dense, fine grained	
10	8-12	DP-3	4'		6-8' Inorganic Clay (CL) orange, moist, stiff 8-9' Same as 1-4'	Water Table at 12.5'
	12-16	DP-4	4'		9-12' Inorganic Clay (CL) orange/grey, moist, stiff 12-16' Clayey sand (SC) grey, wet, medium dense, fine grained.	1135 - stopped drilling
15					Color change to orange at 14'	Collected at 1215
20					End of boring 16'	CTCA-SB74-2-7-09C
						XRF No Detections



PROJECT NUMBER 377812	BORING NUMBER SB75/TW38	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-11 CJCA LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT DPT with Geoprobe 540T  
 WATER LEVELS 11' bgs START 7/21/09 1155 FINISH 7/21/09 1230 LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	4'		0-1' Well graded sand (SW) Dark grey, dry, medium dense fine grained.	Cleared 0-5' with hand auger.
	4-8	DP-2	4'		1-4' well graded sand with silt (SW-SM) light brown/orange Moist, medium dense, fine grained.	
	8-12	DP-3	4'		4-5' clayey sand (SC) orange, moist, dense, fine grained.	
10	12-16	DP-4	4'		5-11' Inorganic clay (CL) orange/grey, moist, stiff Wet at 11'	Water Table at 11' bgs
	16-20	DP-5	4'		11-12' Clayey Sand (SC) grey/tan, wet, dense, fine grained	
					12-15' Silty clay (CL) gray/orange, wet, soft	
15					15-17' Clayey sand (SC) Grey, wet, dense, fine grained	XRF reading S 4-6' Pb = 17 ppm As = 16 ppm Zn = 14 ppm 6-7' Pb = 21 ppm 2-4' no detections
					17-20' Silty sand (SM) orange/grey, wet, medium dense, fine grained.	
					20' end of boring	
						Collected <u>CJCA-SB75-4-6-09C</u> at 1230



PROJECT NUMBER 377812	BORING NUMBER SB-76	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-11 LOCATION Camp Leicune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SADAECCO  
 DRILLING METHOD AND EQUIPMENT DPT Geoprobe 54 DT  
 WATER LEVELS 8' bgs START 7/21/09 1645 FINISH 7/21/09 1705 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3.5'		0-0.5' No Recovery 0.5-2' silty clay (CL) Black/grey, Moist, stiff,	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		2'-7' Inorganic Silt (ML) Orange/grey, Moist, Medium stiff, traces sand 7'-8' silty Sand (SM) light grey, wet, loose fine grained	Water at 8' bgs
10					End of boring 8'	<u>XRF</u> 2-4' Pb=10 ppm As= 4 ppm Zn= 9 ppm 4-6' Pb=24 ppm Zn= 24 ppm Cu= 21 ppm 6-7' Pb=19 ppm Zn= 9 ppm Cu= 13 ppm Collected sample <u>(CJCA-SB76-4-6-09C)</u> at 1710.



PROJECT NUMBER 377812	BORING NUMBER SB77	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTC-11 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SADAECCO  
 DRILLING METHOD AND EQUIPMENT DPT Geoprobe S4DT  
 WATER LEVELS 10' bgs START 7/21/09 1715 FINISH 7/21/09 1745 LOGGER P. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' Silty Sand (SM) Black/gray, Moist, medium dense, Medium grained sand	Hand Auger cleared 0-5'
	4-8'	DP-2	4'		4-10' sandy Clay (CL) orange/tan, Moist, stiff, some fine grained sand	Water at 10'
10	8-12'	DP-3	4'		10-11' Inorganic Silt (ML) orange/grey, wet, medium stiff, some trace sand	
					11-12' Silty Sand (SM) orange/light grey, wet loose, fine grained sand	
					End of Boring 12'	
						XRF Readings 2-4' Pb = 7 ppm As = 2 ppm Zn = 13 ppm Cu = 19 ppm 4-6' Pb = 7 ppm As = 15 ppm 6-7' Pb = 11 ppm As = 4 ppm Zn = 24 ppm Collected sample C/JCA-SB74-2-4-09C @ 1750



PROJECT NUMBER

377812

BORING NUMBER

SB-78

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-11 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SADAECCO  
 DRILLING METHOD AND EQUIPMENT DPT Geoprobe 540T  
 WATER LEVELS 10' bgs START 7/21/09 1420 FINISH 7/21/09 1450 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' Silty Sand (SM) Dark Brown, dry, medium dense, fine grained	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		2-4' Poorly Graded Sand (SP) light tan, moist, dense, fine grained, Trace sand	
	8-12'	DP-3	4'		4-11' Sand clay (CL) light tan, moist, stiff fine grained Wet at 10' 11-12' Clayey Sand (SC) orange/tan, wet, dense, medium grained	Water Table at 10' bgs  XRF 2-4' Pb = 3 PPM As = 6 PPM Cu = 5 PPM 4-6' Pb = 36 PPM Zn = 32 PPM Cu = 26 PPM 6-7' Pb = 18 PPM As = 3 PPM Zn = 10 PPM Cu = 5 PPM  Collected sample CTCA-SB78-4-6-09C @ 1500
10					End of boring 12'	



PROJECT NUMBER

377812

BORING NUMBER

IRIS-SB01

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

PowerProbe 9500 UTR

WATER LEVELS

NA

START 7/29/09 1310

FINISH 7/29/09 1320

LOGGER

D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	1'		0-3' No Recovery 3-4' Silty sand (SM) light brown/tan, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		4-5' Sand (SP) white/grey, moist, loose, fine grained 5-6' Clayey Sand (SC) orange/tan, moist, dense, fine grained 6-8' Sandy clay (CL) orange, moist, stiff End of Boring 8' bgs	XRF 2-4' Fe = 101 PPM 4-6' Pb = 12 PPM Cu = 7 PPM Fe = 242 PPM 6-8' Fe = 32 PPM Cu = 2 PPM FID - No readings Collected sample IRIS-SB01-4-6-09C @ 1320



PROJECT NUMBER

377812

BORING NUMBER

IRIS-5002/TW01 SHEET 1 OF 1

## SOIL BORING LOG

PROJECT

CTC-011

LOCATION

IRIS Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Powerprobe 9500 UTR

WATER LEVELS

14.5' bgs

START

7/26/09 1530

FINISH

7/26/09 1620

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) light grey/brown, moist, loose, fine grained	Hand Auger cleared 0-5' bgs.  FID - No detections in sample bags XRF - No detections in sample bags
	4-8'	DP-2	3'		2-3' Clayey Sand (SC) orange/tan, moist, medium dense, fine grained	
	8-12'	DP-3	3'		3-4' silty sand (SM) light grey, moist, medium dense, fine grained	
10	12-16'	DP-4	4'		4-5' No Recovery 5-6' same as 3-4' 6-8' Sandy Clay (CL) orange/tan, moist, stiff	water table @ 14.5' bgs  Collected sample IRIS-5002-2-7-09C and IRIS-50020-2-7-09C @ 1620
	16-20'	DP-5	4'		8-9' No Recovery 9-20' Sand (SP) white/grey, moist, loose, fine grained. wet @ 14.5'	
					End of boring 20' bgs	
15						well construction details IRIS-TW01 1" pre-packed screen 1 bag #2 sand Screen: 10-20' bgs Sand: 10-20' bgs Bentonite: 9-10' bgs well set at 20' bgs
20						



PROJECT NUMBER

377812

BORING NUMBER

IRIS-SB03

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Power Probe 95cc VTA

WATER LEVELS

NA

START

7/21/09 1320

FINISH

7/29/09 1330

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' silty sand (SM) light brown/tan, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		4-5' clayey sand (SC) light grey, moist, dense, fine grained 5-7' sandy clay (CL) orange, moist, stiff 7-8' sand (SP) white/grey, moist, loose, fine grained.	XRF 2-4' Fe=132 PPM 4-6' Fe=101 PPM 6-7' Fe=89 PPM FID - No Readings
					End of Boring 8' bgs	Collected Sample IRIS-SB03-2-7-09C @ 1330



PROJECT NUMBER 377812	BORING NUMBER IRIS-SB04/TW02	SHEET 1 OF 1
SOIL BORING LOG		

PROJECT CTC-011 LOCATION IRIS Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Power Probe 9500 VTR  
 WATER LEVELS 15.5' bgs START 7/27/09 0830 FINISH 7/27/09 0910 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-3' silty sand (SM) Black/grey, moist, loose, fine grained	0-5' bgs Cleared with hand Auger  XRF and FID No detections
	4-8'	DP-2	4'		3-4' Sand (SP) white/tan, moist, loose, fine grained	
	8-12'	DP-3	4'		4-5' clayey sand (SC) grey/tan, moist, dense, fine grained	
10	12-16'	DP-4	4'		5-7' Sandy clay (CL) orange/tan, moist, stiff	Water table @ 15.5' Collected Sample IRIS-SB04-2-7-09C @ 0900
	16-20'	DP-5	4'		7-14' Sand (SP) white/grey, moist, loose, fine grained	
					14-15' Sandy clay (CL) Same as 5-7'	
15					15-20' Sand (SP) white with orange streaks, wet, loose, fine grained.	IRIS-TW02 Well Construction details Well set to 20' bgs Using 1" pre-packed Screen. 1 bag of #2 Sand Screen: 10-20' bgs Sand: 10-20' bgs Bentonite: 9-10' bgs
20					End of boring 20' bgs	



PROJECT NUMBER

377812

BORING NUMBER

IRIS-SB05/TW03

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011 LOCATION IRIS Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 14' bgs START 7/27/09 0915 FINISH 7/27/09 0945 LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-2.5' Peat (Pt) Black, moist, loose	Hand Auger cleared 0-5' bgs
	2.5-3.5'				Silty sand (SM) grey/tan, moist, loose, fine grained	
	3.5-4.5'	DP-2	4'		Clayey sand (SC) grey/orange, moist, dense, fine grained	Water table @ 14' bgs
10	4.5-5.5'				Sandy clay (CL) light grey/orange, moist, stiff	XRF and FID No detections
	5.5-16'	DP-3	4'		Sand (SP) white/orange, moist, loose, fine grained	Driller could not drill past 16' bgs.
15	12-16'	DP-4	4'		wet @ 14' bgs	
					End of Boring Log 16'	IRIS-TW03 Construction details Well set to 18' bgs using 1" pre-packed screen. Contractor used <del>1/2" bag</del> bag #2 sand) Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs Collected samples @ 0945 IRIS-SB05-2-7-09C IRIS-SB05-2-7-09C-MS IRIS-SB05-2-7-09C-SD



PROJECT NUMBER

377812

BORING NUMBER

IRIS SB06/TWO4 SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTG-011 LOCATION IRIS Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 UTR  
 WATER LEVELS 13.5' bgs START 7/27/09 1050 FINISH 7/27/09 1110 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' Sand (SP) white/grey, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		4-5' Clayey sand (SC) light grey, moist, dense, fine grained	
	8-12'	DP-3	3'		5-7' Sandy clay (CL) orange/tan, moist, very stiff	
10	12-16'	DP-4	4'		7-8' Sand (SP) same as 2-4'	Water table @ 13.5' bgs Driller could not drill deeper than 16' bgs
					8-9' No Recovery 9-16' Sand (SP) white/grey, moist, loose, fine grained. orange staining @ 13' wet @ 13.5'	
15					End of Boring 16' bgs	IRIS-TWO4 Construction details 1" pre-packed screen 1 bag of #2 sand well set @ 18' bgs Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs  XRF and FID no detections  collected sample IRIS-SB06-2-7-09C @ 1110.



PROJECT NUMBER  
377812BORING NUMBER  
IRIS-SB07/TW05 SHEET 1 OF 1

## SOIL BORING LOG

PROJECT CTC-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 10' bgs START 7/27/09 1140 FINISH 7/27/09 1215 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' Silty sand (SM) grey, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs.
	4-8'	DP-2	3'		4-5' No Recovery 5-6' Clayey Sand (SC) Dark grey, moist, medium dense, fine grained	FID - No Detection S Water table @ 10' bgs
10	8-12'	DP-3	4'		6-10' Sand (SP) White/grey, moist, loose, fine grained wet @ 10' 10-12' Sandy Clay (CL) light grey/orange, wet stiff	XRF 4-7' No Detections 2-4' Pb=3ppm Zn=5ppm Driller could not drill deeper than 12' bgs.
					End of Boring 12' bgs	IRIS-TW05 Well Construction details 1" Pre-packed screen 1/2 bag #2 sand. Screen: 6-16' bgs Sand: 6-16' bgs Bentonite: 5-6' bgs Well set 16' bgs @ 1220 Collected sample IRIS-SB07-2-4-09C @ 1210



PROJECT NUMBER <u>3TTR12</u>	BORING NUMBER <u>1R15-SB08</u>	SHEET <u>1</u> OF <u>1</u>
<b>SOIL BORING LOG</b>		

PROJECT C10-11 C51A LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAENA CO  
 DRILLING METHOD AND EQUIPMENT HA & BT w/Geoprobe 54BT  
 WATER LEVELS 4.5' bgs START 1245 7/29/09 FINISH 1305 7/29/09 LOGGER S. Berube

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
	0-4	DP-1	4		0-4 Silty Sand (SM), <sup>st</sup> gray, moist, loose, vfg	
	4-8	DP-2	4		4-6 Clayey Sand (SC), gray, wet, m. dense, vfg-fg 6-8 Sandy Clay (CL), orange, wet, m. stiff, vfg	water @ 4.5' bgs
					Boring complete @ 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

IR15-5609

SHEET

1

OF 1

## SOIL BORING LOG

PROJECT CTO-11 GJALOCATION Camp LejeuneELEVATION Not surveyedDRILLING CONTRACTOR SAEDACCODRILLING METHOD AND EQUIPMENT NA & DPT w/ Geoprobe 5410TWATER LEVELS —START 1330 7/29/09FINISH 1340 7/29/09LOGGER S. Berillo

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS  6"-6"-6" (N)	SOIL DESCRIPTION  SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS  DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
	0-1	DE-1	2		0-2 No Recovery 2-2.5 Clayey Sand (SC), tan, dry, dense, vfg	
	4-8	DE-2	4		2.5-3.5 Rusty metal fragments 1-30 mm diameter 3.5-6 Clayey Sand (SC), tan, dry, dense, vfg, some metal & glass fragments 6-8 Sand (SP), lt gray, dry, loose, vfg Boring completed @ 8' bgs	Sample: <div>IR15-5609-2-7-09C</div>



PROJECT NUMBER

377812

BORING NUMBER

IRIS-SB10

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTC-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

PowerPiche 95cc VTR

WATER LEVELS

NA

START

7/29/09 1335

FINISH

7/29/09 1345

LOGGER

D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
S	0-4'	DP-1	3'		0-1' No Recovery 1-1.5' Peat (Pt) Black, moist, loose	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		1.5-2.5' Clayey sand (sc) orange/tan, moist, loose, fine grained 2.5-3' Sand (sp) white/grey, moist, loose, fine grained 3-4' Clayey sand (sc) orange, moist, loose, fine grained 4-7' Sandy clay (cl) orange/tan, moist, stiff 7-8' Sand (sp) Same as 2.5-3'	FID 2-4' 0.1 PPM 4-7' 0 PPM XRF 2-4' Rb=5PPM Fe=44PPM Sr=10PPM Pb=3PPM Zn=17PPM 4-6' Fe=57PPM 6-7' Fe=32PPM Collected sample IRIS-SB10-2-4-09C @ 1400
					End of Boring Log 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

IR17-ISO1

SHEET

OF

## SOIL BORING LOG

PROJECT CT0-11 CICA

LOCATION Camp Lejeune, NC

ELEVATION Not surveyed

DRILLING CONTRACTOR SREDALCO

DRILLING METHOD AND EQUIPMENT HA &amp; DPT w/ Geoprobe 54DT

WATER LEVELS 5' bgs

START 0916 7/27/09 FINISH 0920 7/27/09

LOGGER S. Benville

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4	DP-1	3		0-1 No Recovery 1-4 Clayey Sand (SC), tan, moist, v. dense, vfg	XRF (ppm) FID (ppm) 2-4" NR
	4-8	DP-2	3		4-5 No Recovery 5-8 Silty Sand (SM), tan, wet, m. dense, vfg, little clay	4-6" Not collected (wet) water @ 5' bgs 6-7" Not collected (wet)
10					Boring completed @ 8' bgs	Sample: IR17-SB01-2-4-09C @ 09:25



PROJECT NUMBER <b>377812</b>	BORING NUMBER <b>IR17-SB02/TW01</b>	SHEET <b>1</b>	OF <b>1</b>
<b>SOIL BORING LOG</b>			

PROJECT CTC-011 LOCATION IR17 Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT PowerProbe 9500 VTR  
 WATER LEVELS 12' bgs START 7/28/09 1000 FINISH 7/28/09 1030 LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery	Hand Auger cleared 0-5' bgs
					2-4' Silty sand (SM) Brown/grey, moist, loose, fine grained	
10	4-8'	DP-2	4'		4-10' Clayey sand (SC) light gray/orange, moist, dense, fine grained	Water table @ 12' bgs  XRF - No detections FIID - No detections
	8-12'	DP-3	4'		10-12' sandy clay (CL) light grey with orange streaks, moist, stiff	
					12-16' Sand (SP) tan/grey, wet, loose, fine grained	
15	12-16'	DP-4	4'		End of Boring 16' bgs	Collected sample IR17-SB02-2-7-09C @ 1030  IR17-TW01 Construction Details 1" Pre-packed screen 1 Bag of #2 sand well set at 16' bgs Sand: 6-16' bgs Screen: 6-16' bgs Bentonite: 5-6' bgs



PROJECT NUMBER

377812

BORING NUMBER

IR17-SB03

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTC-011 LOCATION IR17 Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAE DACC  
 DRILLING METHOD AND EQUIPMENT PowerProbe 9500 VTR  
 WATER LEVELS NA START 7/28/09 1055 FINISH 7/28/09 1110 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
S	0-4'	DP-1	2.5'		0-1.5' No Recovery 1.5-2' Silty Sand (SM) light brown/grey, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		2-3.5' Clayey Sand (SC) light brown/grey, moist, dense, fine grained	XRF No Detections
					3.5-8' Sandy Clay (CL) light grey with orange streaks, moist, stiff	FID No Detections
					End of Boring Log 8' bgs	Collected samples IR17-SB03-2-7-09C @ 1110 IR17-SB03D-2-7-09C @ 1115



PROJECT NUMBER <b>377812</b>	BORING NUMBER <b>06</b> <b>377812</b> SHEET <b>1</b> OF <b>1</b>
IR17-SB04/TWO2 <b>SOIL BORING LOG</b>	

PROJECT **CTO-011** LOCATION **IR17 Camp Lejeune, NC**  
 ELEVATION **Not Surveyed** DRILLING CONTRACTOR **SAEDACCO**  
 DRILLING METHOD AND EQUIPMENT **Power Probe 9500 VTR**  
 WATER LEVELS **11' bgs** START **7/28/09 1130** FINISH **7/28/09 1150** LOGGER **D. Brown/CLT**

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) light brown/grey, moist, loose, fine grained.	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		2-4' Clayey sand (SC) light grey, moist, dense, fine grained.	
	8-12'	DP-3	4'		4-9' sandy clay (CL) light grey/tan, moist, stiff 9-11' Same as 2-4' 11-12' Sand (SP) grey with orange staining, wet, loose, fine grained	Water table @ 11' bgs <u>XRF</u> No Detections <u>FID</u> No detections
10					End of Boring 12' bgs	Driller could not drill deeper than 12' bgs.
15						IR17-TWO2 well Construction details well set to 17' bgs Screen: 7-17' bgs Sand: 7-17' bgs Bentonite: 5-7' bgs  Collected sample IR17-SB04-27-09C @ 1200



PROJECT NUMBER

377812

BORING NUMBER

IR17-SB05

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011 LOCATION IR17 Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Power Probe 9500 UTR  
 WATER LEVELS NA START 7/28/09 1330 FINISH 7/28/09 1345 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
S	0-4'	DP-1	2'		0-2' No Recovery 1-2' silty sand (SM) black/brown, moist, loose, fine grained	Hand Auger Cleared 0-5' bgs
	4-8'	DP-2	4'		2-4' clayey sand (SC) tan/orange, moist, dense, fine grained 4-8' sandy clay (CL) tan/grey, moist, stiff	XRF No detections FIO No detections
					End of Boring Log 8' bgs	Collected Sample IR17-SB05-2-7-09K @1400



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB06

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lejeune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Power Probe 9500 VTR

WATER LEVELS

NA

START

7/29/09 0820

FINISH

7/29/09 0940

LOGGER

D. Brown / C. LT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
S	0-4'	DP-1	2'		0-2' No Recovery 2-3' silty sand (SM) brown/black, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		3-5' clayey sand (SC) orange/tan, moist, dense, fine grained	XRF No Detections
					5-8' sand (SP) white/grey, moist, dense, fine grained	FID No Readings Collected samples IR85-SB06-2-7-09C IR85-SB06-2-7-09C-MS IR85-SB06-2-7-09C-SD E 0850



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB07

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011 LOCATION Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS NA START 7/28/09 1640 FINISH 7/28/09 1650 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery	Hand Auger Cleared
					2-3' Silty Sand (SM) grey/brown, moist, loose, fine grained	0-5' bgs
10	4-8'	DP-2	3'		3-4' Clayey Sand (SC) tan/orange, moist, medium dense, fine grained.	XRF 2-4' Zn=21 PPM 4-7' Fe=217 PPM FID 2-4' 2 PPM 4-7' No Detections
					4-5' No Recovery	
					5-8' Sand (SP) white/grey, moist, loose, fine grained	Collected sample IR85-SB07-2-4-09C @ 1655
					End of Boring Log 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB07/TW06 SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTC-011 LOCATION IR85 Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 11' bgs START 7/28/09 0820 FINISH 7/28/09 0845 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-2' silty sand (SM) brown/black, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		2-6' clayey sand (SC) orange/tan, moist, dense, fine grained	XRF and FID No detections
10	8-12'	DP-3	4'		6-11' sand (SP) light grey/white, moist, loose, fine grained	Water table @ 10' bgs
	12-16'	DP-4	4'		11-16' clayey sand (SC) light grey, wet, medium dense, fine grained	Collected sample IR85-SB07-2-7-09C @ 0850
15					End of Boring 16' bgs	Driller could not drill deeper than 16' bgs,  IR85-TW06 well, Construction Details Well set to 16' bgs using 1" pre-packed Screen. Screen: 6-16' bgs Sand: 6-16' bgs Bentonite: 5-6' bgs



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB08

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011 LOCATION IR85 Camp Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 UTR  
 WATER LEVELS NA START 7/28/09 1710 FINISH 7/28/09 1730 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recovery 1-3' Silty sand (SM) grey/brown, moist, loose, fine grained	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	3'		3-4' Clayey sand (SC) tan/orange, moist, dense, fine grained 4-5' No Recovery 5-8' sand (SP) white/grey, moist, loose, fine grained	
					End of Boring Log 8' bgs	XRF No detections FID No Detections  Collected sample IR85-SB08-6-7-09C @1725



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB09/TW05 SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTC-011 LOCATION CAMP Lejeune, NC  
 ELEVATION Not Surveyed DRILLING CONTRACTOR SAE DACC0  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 UTR  
 WATER LEVELS 14' bgs START 7/27/09 1510 FINISH 7/27/09 1600 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	3'		0-1' No Recover Y 1-3' Silty Sand (SM) grey/brown, moist, loose, fine grained	Hand Auger cleared 0-5' bgs.
	4-8'	DP-2	4'		3-4' Clayey Sand (SC) orange/tan, moist, dense fine grained	XRF No Detections FID No Detections
	8-12'	DP-3	4'		4-6' Silty Sand (SM) Same as 1-3' 6-20' Sand (SP) white/grey, moist, loose, fine grained Wet @ 14'	IR85-TW05 Construction details 1" Prepacked Screen 1 bag of #2 Sand well set @ 20' bgs
15	12-16'	DP-4	4'		color change: Black @ 13.5' color change: grey 14.5'	Screen @ 10-20' bgs Sand @ 10-20' bgs Bentonite @ 9-10' bgs
	16-20'	DP-5	4'		End of boring 20' bgs	Collected sample IR85-SB09-2-7-09C @ 1550
20						Water table @ 14' bgs



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB10

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

Camp Lexune, NC

ELEVATION

Not Surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Power probe 9500 VTR

WATER LEVELS

NA

START

7/29/09 0900

FINISH

7/29/09 0940

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-4' clayey sand (SC) orange/tan, moist, dense, fine grained	Hand Auger cleared 0-5' bgs FID - No Detections
	4-8'	DP-2	3'		4-5' No Recovery 5-8' Sand (SP) white/grey, moist, loose, fine grained.	XRF 2-4' No detections 4-6' Zn = 2225 PPM Cu = 4860 PPM
					End of boring - 8' bgs	6-7' Zn = 75 PPM Cu = 143 PPM Pb = 671 PPM



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB11

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT C To-011

LOCATION Camp Lejeune, NC

ELEVATION Not Surveyed

DRILLING CONTRACTOR SAEDACCO

DRILLING METHOD AND EQUIPMENT Power Probe 9500 VTA

WATER LEVELS NA

START 7/29/09 0955

FINISH 7/29/09 1005

LOGGER D. Brown/CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2.5-3.0' Peat (Pt) Black, moist, loose	Hand Auger cleared 0-5' bgs
	3-3.5'				3-3.5' Silty sand (sm) grey/brown, moist, loose, fine grained	XRF No Detections
	4-8'	DP-2	4'		3.5-5.0' Clayey sand (sc) tan/orange, moist, dense, fine grained	FID - No Detections
					5-8' Sand (SP) white/grey, moist, loose, fine grained	collected sample IR85-SB11-2-7-09C @1010
					End of Boring 8' bgs	



PROJECT NUMBER

377812

BORING NUMBER

IR85-SB13/Two7 SHEET

1 OF 1

## SOIL BORING LOG

PROJECT

CTO-011

LOCATION

IR85 Camp Lejeune, NC

ELEVATION

Not surveyed

DRILLING CONTRACTOR

SAEDACCO

DRILLING METHOD AND EQUIPMENT

Powerprobe 9500 VTR

WATER LEVELS

10' bgs

START

7/28/09 1420

FINISH

7/28/09 1445

LOGGER

D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery 2-2.5' Peat (PT) Black, Moist, loose	Hand Auger Cleared 0-5' bgs:
	4-8'	DP-2	4'		2.5-3.5' Silty sand (SM) Brown, Moist, loose, fine grained	
10	8-12'	DP-3	4'		3.5-6' Clayey sand (CL) orange/tan, Moist, medium dense, fine grained	Water table @ 10' bgs XRF NO Detections FID NO Detections Collected sample IR85-SB13-2-7-09C @ 1500
	12-16'	DP-4	4'		6-12' Sand (SP) white/grey, Moist, loose, fine grained wet @ 10' bgs Driller could not drill beyond 12' bgs	
15						IR85-Two7 well Construction Details well set to 17' bgs Using 1" pre-packed screen and 1 bag of #2 sand Screen: 7-17' bgs Sand: 7-17' bgs Bentonite: 6-7' bgs



PROJECT NUMBER 377812	BORING NUMBER IR85-SB14	SHEET 1	OF 1
<b>SOIL BORING LOG</b>			

PROJECT CTO-011 LOCATION CAMP Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT PowerProbe 9500 VTR  
 WATER LEVELS NA START 7/29/09 0855 FINISH 7/29/09 0920 LOGGER D. Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	1.5'		0-2.5' No Recovery 2.5-3.5' Silty sand (SM) Brown/grey, moist, loose, fine grained	Hand Auger cleared 0-5' bgs
	4-8'	DP-2	4'		3.5-6' Clayey Sand (SC) orange/tan, moist, dense, fine grained 6-8' Sand (SP) white/grey, moist, loose, fine grained End of Boring 8' bgs	FID - No readings XRF - 2-4' Fe=123PPM Cu=21PPM 4-6' Fe=175PPM Zn=3PPM 6-7' Fe=451PPM Zn=21PPM Collected Sample IR85-SB14-2-7-09C © 09/5



PROJECT NUMBER

BORING NUMBER

IR85-SB17/TW08

SHEET

1 OF 1

## SOIL BORING LOG

PROJECT CTO-011 LOCATION IR85 Camp Lejeune, NC  
 ELEVATION Not surveyed DRILLING CONTRACTOR SAEDACCO  
 DRILLING METHOD AND EQUIPMENT Powerprobe 9500 VTR  
 WATER LEVELS 11' bgs START 7/28/09 1515 FINISH 7/28/09 1540 LOGGER Di Brown / CLT

DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	INTERVAL	NUMBER AND TYPE	RECOVERY (FT)			
5	0-4'	DP-1	2'		0-2' No Recovery	Hand Auger Cleared 0-5' bgs
					2-3' silty sand (SM) light brown/black, moist, loose, fine grained	
	4-8'	DP-2	3'		3-4' clayey sand (SC) tan/orange, moist, medium dense, fine grained	Water table @ 11' bgs
					4-5' No Recovery	
10	5-8'				5-8' sand (SP) white/grey, moist, loose, fine grained	Driller could not drill deeper than 16' bgs
	8-12'	DP-3	3'		8-9' No Recovery	
					9-12' sand (SP) white/grey, moist, dense, fine grained, wet @ 11' bgs	XRF 6-7' Cu = 7 PPM Zn = 21 PPM FID No Detection S
	12-16'	DP-4	1'		12-15' No Recovery	
15					15-16' sand (SP) same as 9-12' bgs	Collected samples IR85-SB17-6-7-09C @ 1540 IR85-SB17D-6-7-09C @ 1545.
					End of Boring Log 16' bgs	
						IR85-TW08 Construction Details 1" pre-packed screen 1 bag of #2 sand Screen: 8-18' bgs Sand: 8-18' bgs Bentonite: 7-8' bgs Well set to 18' bgs





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IRIS-TP01

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IRIS CCA LOCATION: Camp Johnson LOGGER: EMust

ELEVATION: CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED: DEERE 310g DATE EXCAVATED: 7/27/09

WATER LEVEL: APPROX. DIMENS: Length: 9 ft Width: 2 ft Max. Depth: 2 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS. OVM (ppm):      Headspace Analysis	
1			0-1 - Top soil - Silty Sand (sm) DK grey fy sand + organics (roots) loose, dry-moist	0.0	0-1
2			1-2 - Silty Sand (sm) Lt Tan fy sand & silt, loose, moist, some roots.	0.0	1-1.5
3				0.0	1.5-2
4			Terminated @ 2' bgs		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP01

SHEET 1 of 1

## TEST PIT LOG

PROJECT: 1R15

LOCATION: Camp Johnson

LOGGER: E. Must

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/27/09

WATER LEVEL:

APPROX. DIMENS:

Length:

9 ft

Width:

2 ft

Max. Depth:

2 ft

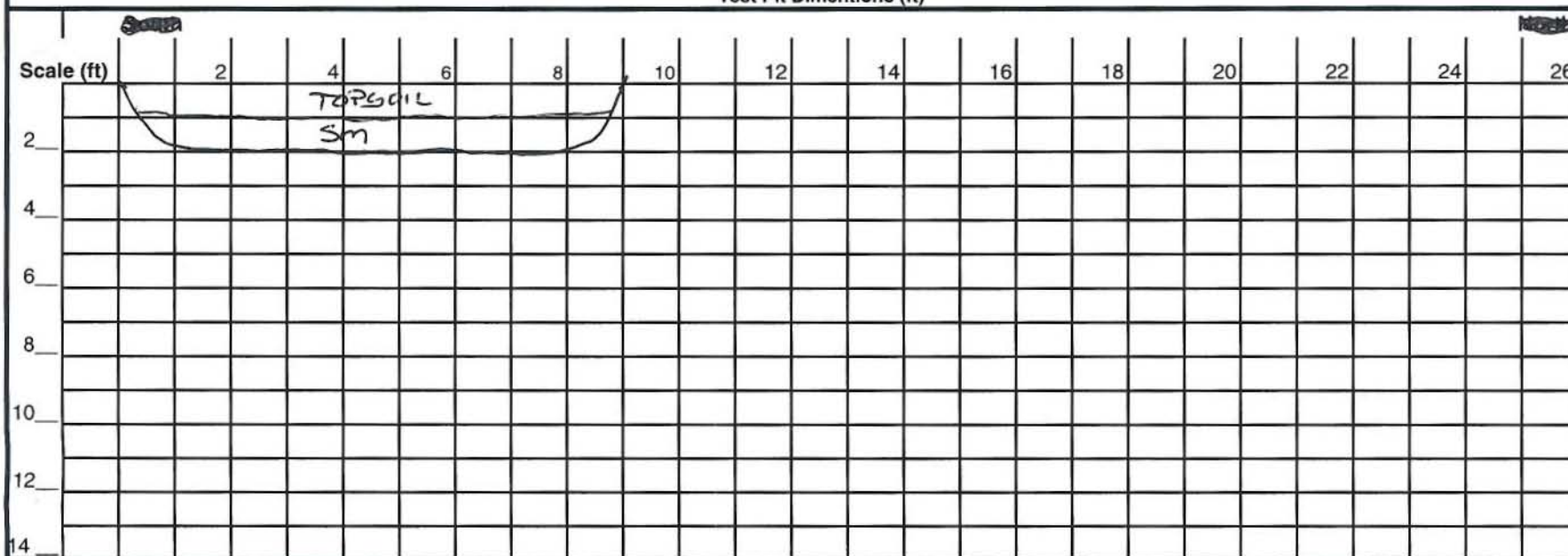
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis

0.0 ppm 0-1  
0.0 1-1.5  
0.0 1-2





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IRIS-TP02

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IRIS

LOCATION: Camp Johnson

LOGGER: EMust

ELEVATION:

CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/27/09

WATER LEVEL:

APPROX. DIMENS: Length: 10 ft

Width: 2 ft

Max. Depth: 3.5 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0 - 0.5 - Topsoil - Dk gray organic rich silt & sand loose, moist	0.0 ppm	oxidated soil
2			0.5 - 2.5 - Silty sand (Sm) - Tan fy sand & silt, loose moist, some brick & PVC		1-2' bgs rust staining and red brick & PVC piping
3			2.5 - 3 - Silty Sand (Sm) - Orange fy sand & silt, loose moist		0.0 ppm from 0-3.5' bgs
4			3 - 3.5 - Sand (SP) - Lt Tan fy sand, loose, moist		
5			Terminated @ 3.5' bgs		
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IR15-TP02

SHEET 1 of 1

## TEST PIT LOG

PROJECT: IR15

LOCATION: Camp Johnson

LOGGER: E must/RDU

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/27/09

WATER LEVEL:

APPROX. DIMENS: Length: 10 ft

Width: 2 ft

Max. Depth: 3.5 ft bgs

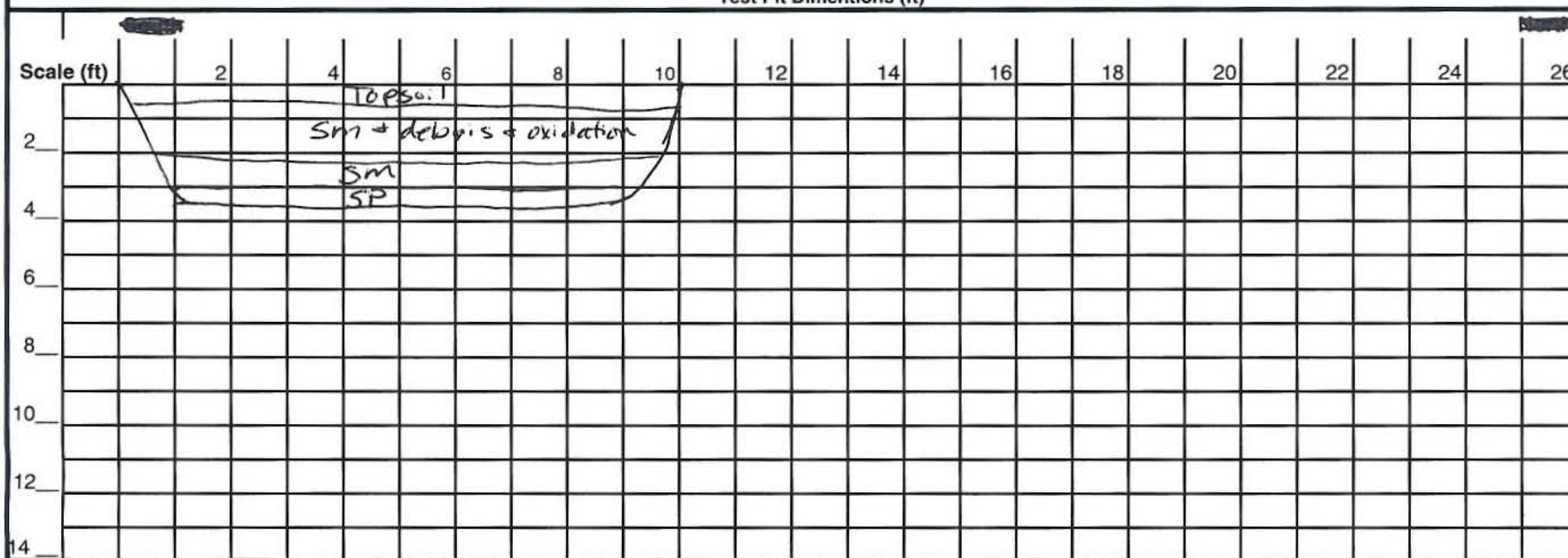
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis

0.0 ppm 0-3.5' bgs





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

1R15-TP03

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: 1215

LOCATION: Camp Johnson

LOGGER: Emust

ELEVATION:

CONTRACTOR: SAEDALCO

EXCAVATION EQUIPMENT USED:

Digger 310g

DATE EXCAVATED: 7/28/09

WATER LEVEL:

APPROX. DIMENS: Length:

8 ft

Width:

2 ft

Max. Depth:

3 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-0.5 - Topsoil - Dk grey organic rich silt & sand, loose, moist	4.1	0-1
2			0.5-2 - Silty Sand (sm) - Tan fy sand, some silt, loose, moist. large roots	0.0	1-2
3			2-3 - Sand (SP) - Lt Tan fy sand, loose, moist	0.0	2-3
4			Terminated @ 3' bgs		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP03

SHEET 1 of 1

## TEST PIT LOG

PROJECT: IR15

LOCATION: Camp Johnson

LOGGER: EMust/RDU

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/28/09

WATER LEVEL:

APPROX. DIMENS:

Length: 8 ft

Width: 2 ft

Max. Depth: 3 ft

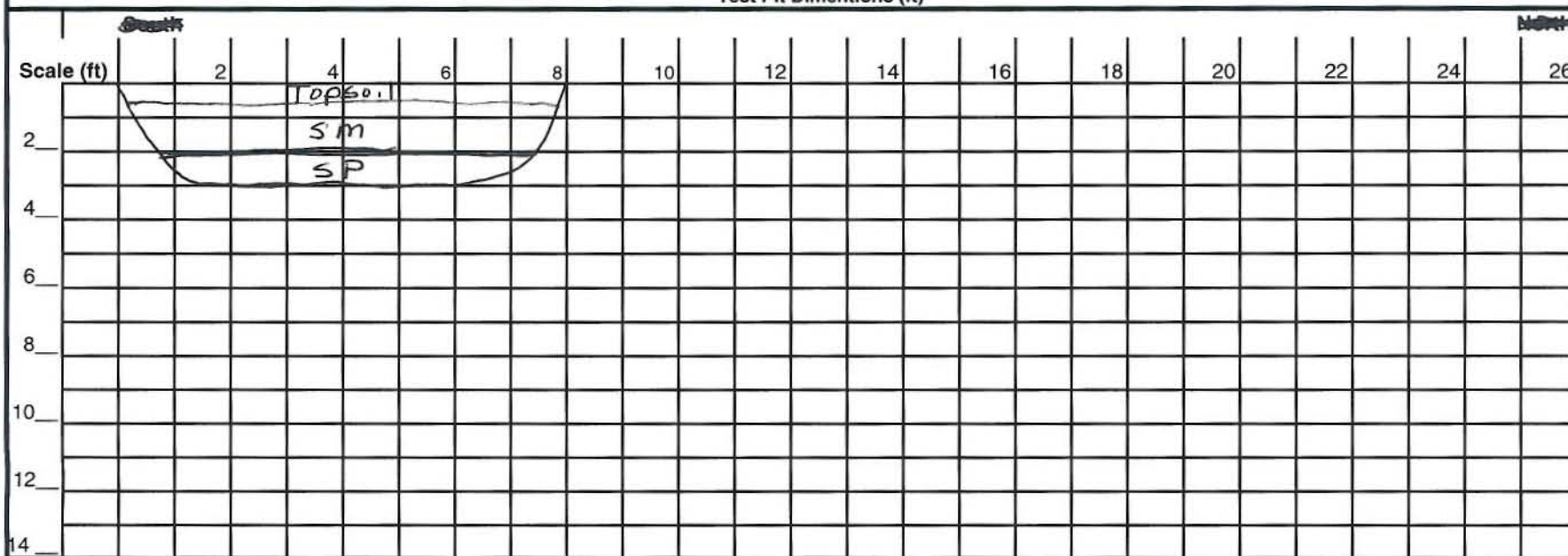
### SOIL DESCRIPTION

### COMMENTS

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

1R15-TP04 SHEET 1 OF 1

## TEST PIT LOG

PROJECT: 1R15 LOCATION: Camp Johnson LOGGER: E. Must

ELEVATION: CONTRACTOR: SAEDACC

EXCAVATION EQUIPMENT USED: Deere 310g DATE EXCAVATED: 7/28/09

WATER LEVEL: APPROX. DIMENS: Length: 9 ft Width: 2 ft Max. Depth: 5 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-0.5 - Topsoil + Silt (sm) - fy Sand + silt, loose, moist	0.0	0-1
2			0.5-3 - Silty Sand (sm) - Tan fy Sand + silt, trace Clay, small coarse sand Size shell fragments, med dense. <del>small</del> mottled orange	0.0	1-2
3			3-4 - Silty Sand (sm) As above - orange	0.0	2-3 Small piece of red ceramic
4			4-5 - Sand (SP) - white - Lt tan fy Sand, loose, moist	0.0	3-4 - metal pipe, Ceramic + glass
5			Terminated @ 5' bgs	0.0	4-5
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

1R15-TP04

SHEET 1 of 1

## TEST PIT LOG

PROJECT :

LOCATION : Camp Johnson

LOGGER : E Must / RDU

ELEVATION :

EXCAVATION EQUIPMENT USED :

Deere 310g

DATE EXCAVATED: 7/28/09

WATER LEVEL :

APPROX. DIMENS:

Length:

9 ft

Width:

2 ft

Max. Depth:

5 ft

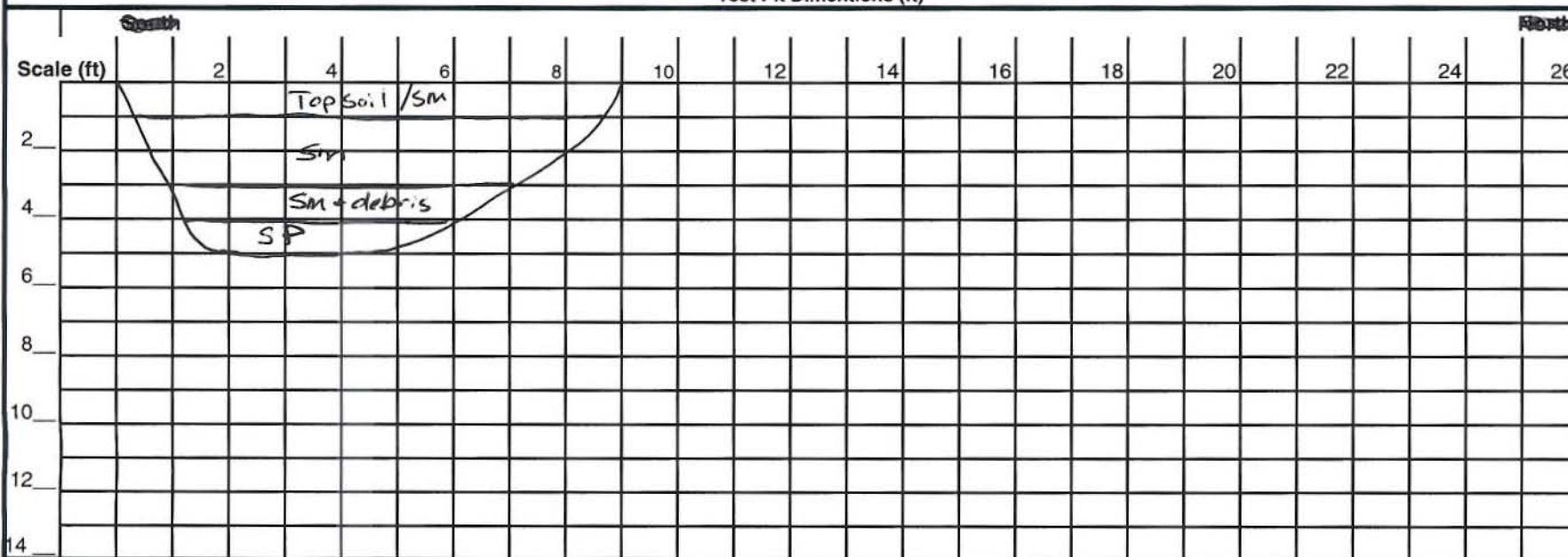
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

0.0 - 0.5' bgs

OVM (ppm):

Breathing Zone Analysis

0.0 ppm





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IRIS-TP05

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IRIS

LOCATION: Camp Johnson

LOGGER: E Must

ELEVATION:

CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED:

Deere 30g

DATE EXCAVATED: 7/28/09

WATER LEVEL:

APPROX. DIMENS: Length: 9 ft

Width: 2 ft

Max. Depth: 7 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DIFFICULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS. OVM (ppm):      Headspace Analysis	
	INTERVAL	NUMBER AND TYPE			
1			0-1 - Topsoil + Silty Sand (sm)	0.0	0-1
2			Dk grey fgy <del>med</del> sand + silt organic rich, moist, loose	0.0	1-2
3			1-3 - Silty sand (sm) -	0.0	2-3
4			Tan + orange fgy sand + silt loose, moist	7.2	3-4
5			3-5 - Sandy clay (CL)		
6			Grey / orange fgy sand + clay, firm, moist	4.3	5-6
7			5-7 - Sand (SP) -		
8			white - Lt Tan fgy sand, loose, moist		
9			Terminated @ 7' bgs		
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP05

SHEET 1 of 1

## TEST PIT LOG

PROJECT: IR 15

LOCATION: Camp Johnson

LOGGER: E Must / RDU

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/28/09

WATER LEVEL:

APPROX. DIMENS:

Length:

9 ft

Width:

2 ft

Max. Depth:

7 ft

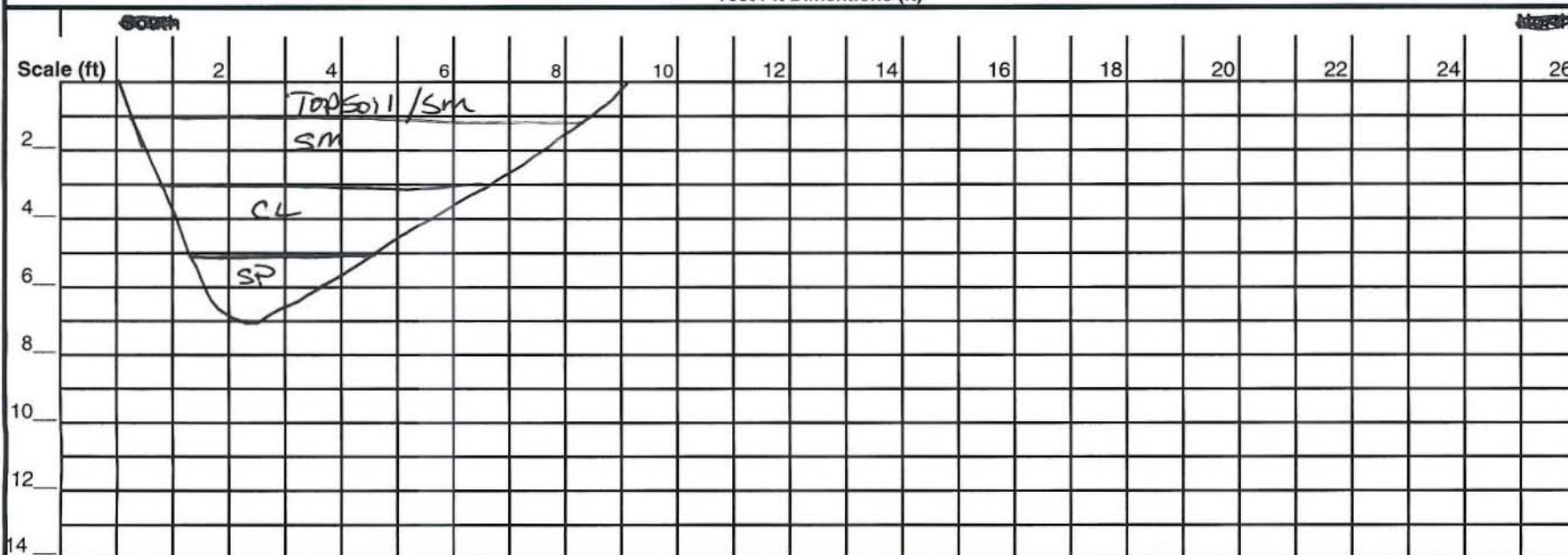
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

IR15-TP06

SHEET 1 OF 1

**TEST PIT LOG**

PROJECT: IR15

LOCATION: Camp Johnson

LOGGER: Emust

ELEVATION:

CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED:

Deere 310g

DATE EXCAVATED: 7/28/09

WATER LEVEL:

APPROX. DIMENS: Length:

9 ft

Width: 2 ft

Max. Depth:

6 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-1 - Topsoil, Mulch, Silty sand Dk grey fg sand + silt, organic rich, mulch, moist	31.4 0-1 - Highly organic 6.9 → recheck PID = 2.0ppm 6.1 1-2	
2			1-2 Silty Sand (sm) -	0.0 2-3	
3			Orangish Tan fg sand, some silt, loose, moist	0.0 3-4	
4			2-3 Sand (SP) - Tan fg - mg sand loose, moist	0.0 4-5	
5			3-5 - Sandy clay (CL)	0.0 5-6	
6			Grey / orange / Tan fg sand + clay, firm, dry-moist.		
7			5-6 - Sand (SP)	0.0 (m)	
8			White - LT Tan fg sand loose, moist		
9			Terminated @ 6' bgs		
10					
11					
12					
13					
14					



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

TP06

SHEET 1 of 1

**TEST PIT LOG**

PROJECT :

IRIS

LOCATION :

Camp Johnson

LOGGER :

EMust

ELEVATION :

EXCAVATION EQUIPMENT USED :

Deere 310g

DATE EXCAVATED :

7/28/09

WATER LEVEL :

APPROX. DIMENS:

Length:

9 ft

Width:

2 ft

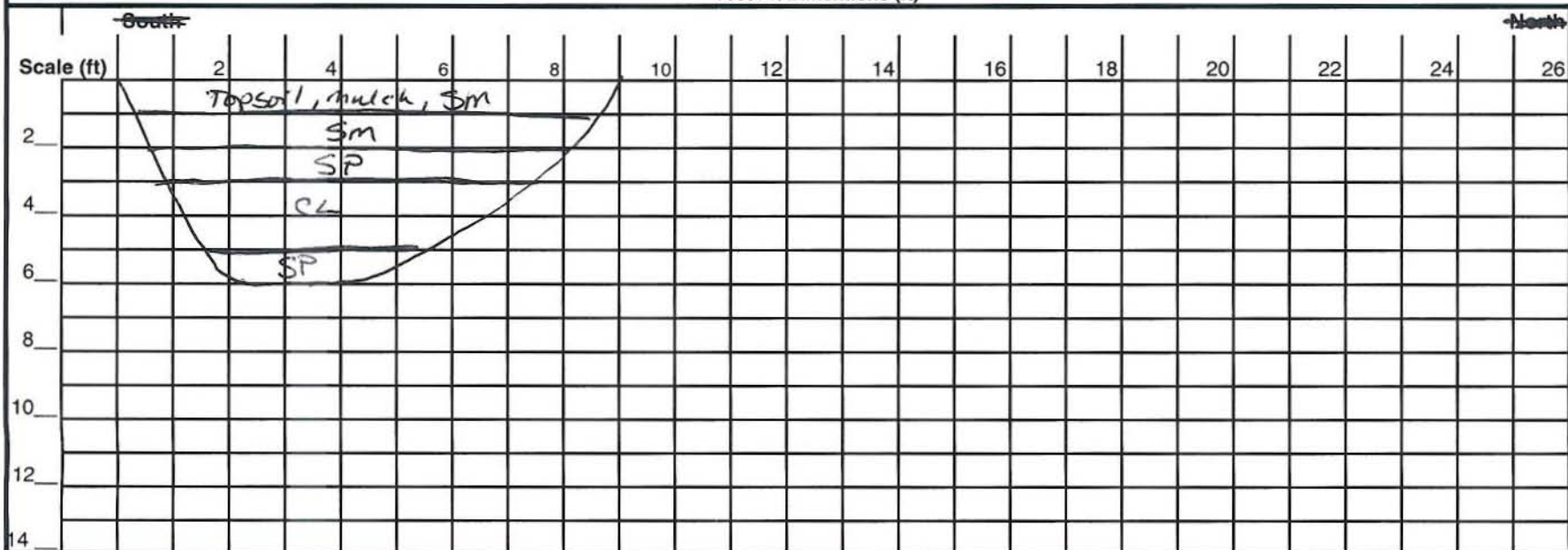
Max. Depth:

16 ft

**SOIL DESCRIPTION****COMMENTS**

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

**Test Pit Dimensions (ft)**

OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IR15-TP07

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IR15 LOCATION: Camp Johnson LOGGER: Emust

ELEVATION: CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED: Dredge 310g DATE EXCAVATED: 7/28/09

WATER LEVEL: APPROX. DIMENS: Length: 10 ft Width: 2 ft Max. Depth: 6 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS. OVM (ppm): Headspace Analysis	
1			0-0.5 - Topsoil - Dk grey organic rich silt & sand. moist	0.0	0-1
2			0.5-3 - Silty Sand (sm)	0.0	1-2
3			Orange tan fgy sand, little silt, loose, moist	0.0	2-3
4			3-5.5 - Sandy Clayless	0.0	3-4
5			Orange / grey fgy sand & clay, firm, dry-moist	0.0	4-5
6			5.5-6 - Sand (SP) -	0.0	5-6
7			Orange / Tan fgy sand, loose, moist.		
8					
9			Terminated @ 6' bgs		
10					
11					
12					
13					
14					



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

TP07

SHEET 1 of 1

**TEST PIT LOG**

PROJECT :

1R15

LOCATION :

Camp Johnson

LOGGER :

EM

ELEVATION :

EXCAVATION EQUIPMENT USED :

Deere 310g

DATE EXCAVATED :

7/28/09

WATER LEVEL :

APPROX. DIMENS:

Length:

10 ft

Width:

2 ft

Max. Depth:

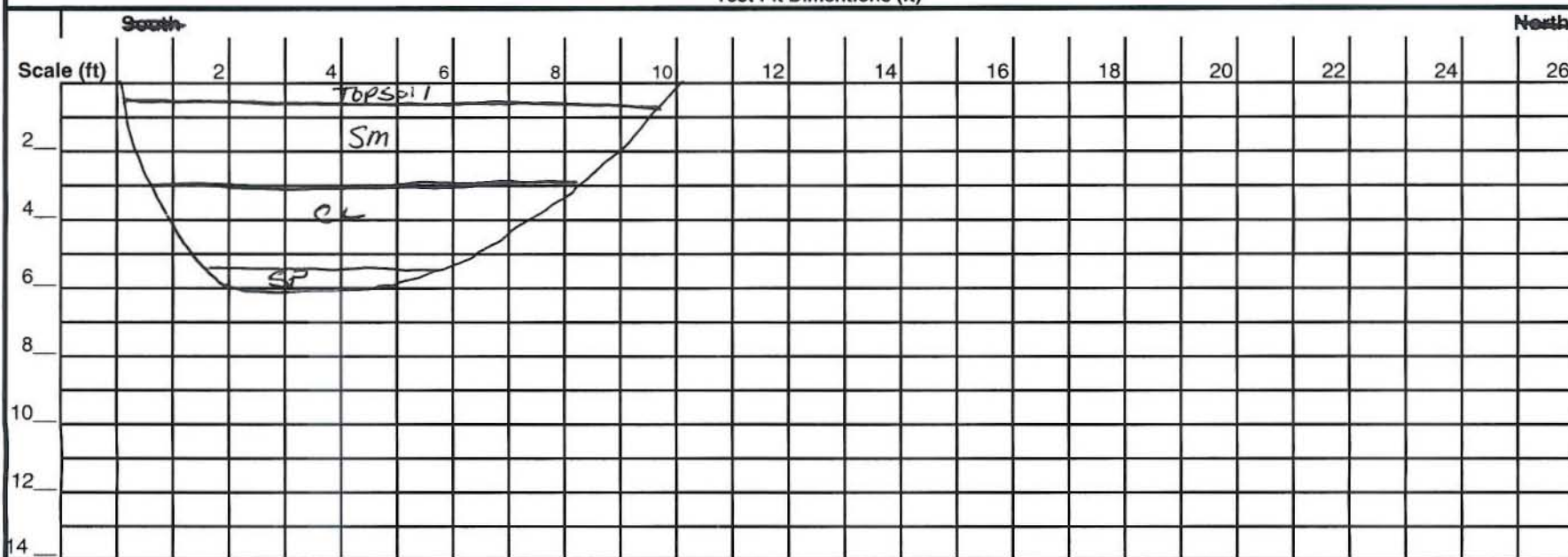
6 ft

**SOIL DESCRIPTION**

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

**COMMENTS**

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

**Test Pit Dimensions (ft)**

OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IR15 TP08

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IR15 LOCATION: Camp Johnson LOGGER: E must  
 ELEVATION: CONTRACTOR: SAEDACCIO  
 EXCAVATION EQUIPMENT USED: Deere 310g DATE EXCAVATED: 7/28/09  
 WATER LEVEL: APPROX. DIMENS: Length: 8 ft Width: 2 ft Max. Depth: 5.5 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS. OVM (ppm): Headspace Analysis	
1			0-0.5 - Topsoil - Dk grey organic silt & sand, loose, dry-moist	0.0	0-1
2			0.5-1 - Sand (SP)	0.0	1-2
3			Tan fy sand, loose, moist	4.5	2-3
4			1-3 - Sandy Clay (CL)	0.0	3-4
5			Grey/Orange fy sand & clay, firm, moist	2.9	4-5
6			3-4 - Silty Sand (SM)		
7			Orange/tan fy sand & silt, loose, moist		
8			4-5.5 Sand (SP)		
9			White fy sand, loose moist		
10			Terminated @ 5.5' bgs		
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP08

SHEET 1 of 1

## TEST PIT LOG

PROJECT :

IR15

LOCATION :

Camp Johnson

LOGGER :

E Must

ELEVATION :

EXCAVATION EQUIPMENT USED :

Deere 310g

DATE EXCAVATED :

7/28/09

WATER LEVEL :

APPROX. DIMENS:

Length:

8 ft

Width:

2 ft

Max. Depth:

5.5 ft

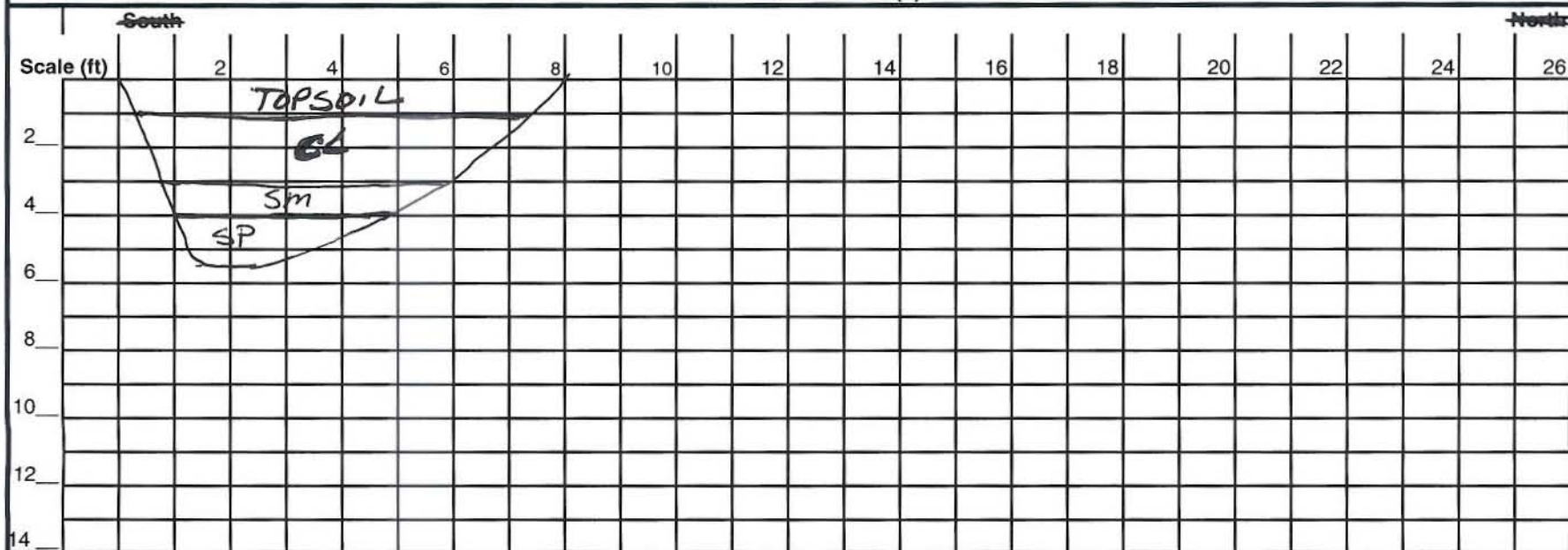
### SOIL DESCRIPTION

### COMMENTS

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVm (ppm): Headspace Analysis

OVm (ppm):

Breathing Zone Analysis



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

1R85-TPD1

SHEET 1 OF 1

**TEST PIT LOG**

PROJECT: 1R85

LOCATION: Camp Johnson

LOGGER: E must

ELEVATION:

CONTRACTOR: SAEDACC6

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS: Length: 7 ft

Width: 2 ft

Max. Depth: 6 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-0.5 - Topsoil - DK brown organic rich silt & sand, loose, dry-moist	0.0	0-1
2			0.5-1.5 Silty Sand (SM)	0.0	1-2
3			Orangeish / Tan fy sand, some silt, loose, moist	0.0	2-3
4			5-6 Sand (SP)	0.0	3-5
5			7 Tan fy sand, loose, moist.		
6					
7					
8			Test pit terminated @ 7' bgs		
9					
10					
11					
12					
13					
14					

move to the left i.e. to a mound w/ batteries on top  
Call it TPD1A





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP01

SHEET 1 of 1

## TEST PIT LOG

PROJECT: 1R85

LOCATION: Camp Johnson

LOGGER: Emust

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS:

Length:

7 ft

Width:

2 ft

Max. Depth:

6 ft

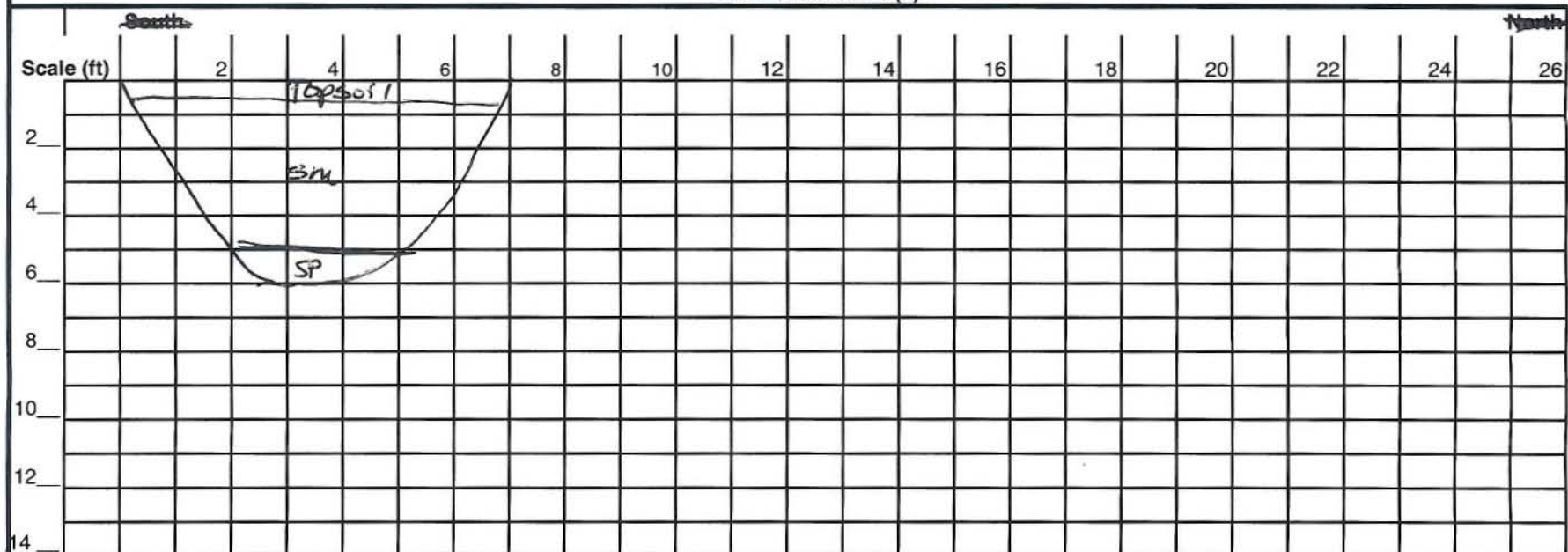
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

TP01.4

SHEET 1 OF 1

**TEST PIT LOG**

PROJECT: IRBS

LOCATION: Camp Johnson

LOGGER: EMust

ELEVATION:

CONTRACTOR: SAEDARCO

EXCAVATION EQUIPMENT USED:

Deere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS: Length:

13 ft

Width:

5 ft

Max. Depth:

3 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-1.5 - Topsoil, Batteries, debris, - DK grey fg sand + silt, batteries & broken glass, loose, moist	0-0	0-2 ft Batteries & glass
2				0-0	2-3 ft
3			1.5-3 - Silty Sand (sm)		
4			Tan fg sand, some silt, loose, moist		
5			Terminated @ 3' bgs		
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP01A

SHEET 10

## TEST PIT LOG

PROJECT: 1R85

LOCATION: Camp Johnson

LOGGER: E Must

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 810g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS: Length: 13 ft

Width: 5 ft

Max. Depth: 8 ft

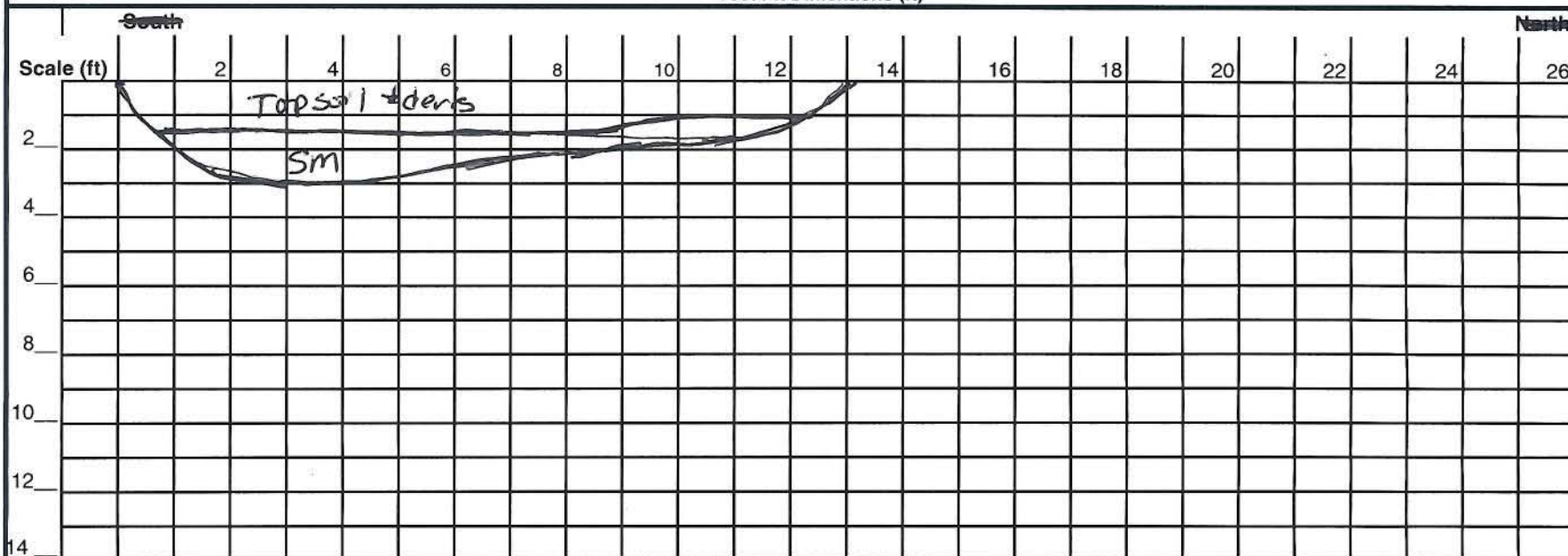
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





PROJECT NUMBER  
977812

TEST PIT NUMBER  
TP02

SHEET 1 OF 1

## TEST PIT LOG

PROJECT : 1R85

LOCATION : Camp Johnson

LOGGER : EMust

ELEVATION :

CONTRACTOR : Drexel

SPEDACTO

DATE EXCAVATED: 7/24/00

EXCAVATION EQUIPMENT USED :

APPROX. DIMENS: Length: 3

Width: 2

Max. Depth: 2

WATER LEVEL :

SOIL DESCRIPTION

COMMENTS

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS, OVM (ppm):	HEADSPACE ANALYSIS
	INTERVAL	NUMBER AND TYPE			

0-0.5  
TOPSOIL + Batteries  
DE grey fg sand silt.  
few batteries  
0.5-2 - Sand (SP)  
Tan fg sand, loose,  
moist  
Terminated @ 2' bgs

0.0 0.1 ft batteries  
at surface.  
0.0 0-2





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IR85-TP02

SHEET 1 of 1

## TEST PIT LOG

PROJECT: IR85

LOCATION: Camp Johnson

LOGGER: EMust

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS:

Length:

3 ft

Width:

2 ft

Max. Depth:

2 ft

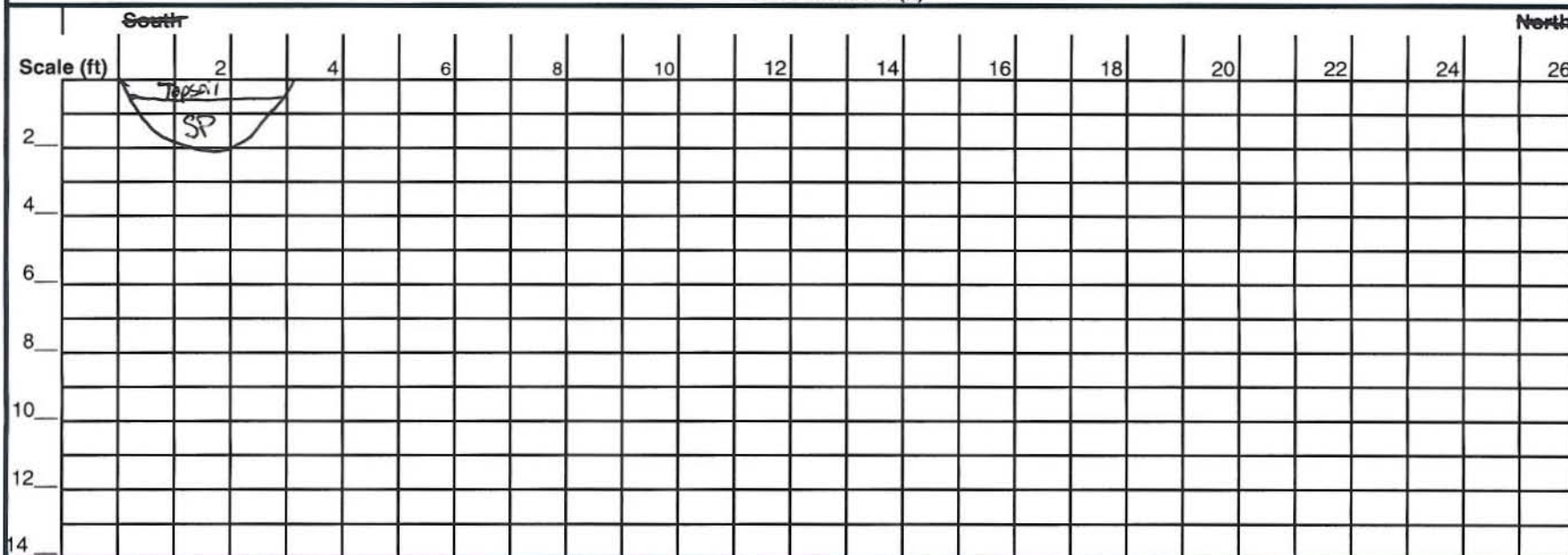
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP03

SHEET 1 OF 1

## TEST PIT LOG

PROJECT :

1985

LOCATION :

Camp Johnson

LOGGER :

Em

ELEVATION :

CONTRACTOR :

SAEDAK

EXCAVATION EQUIPMENT USED :

Deere 310g

DATE EXCAVATED :

7/29/09

WATER LEVEL :

APPROX. DIMENS:

Length:

6 ft

Width:

2 ft

Max. Depth:

2 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL, CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			0-0.5 - Topsoil, few batteries. Dk green fgy sand & silt, loose, moist, few batteries at surface	0.0	0-1. few batteries at surface.
2				0.0	1-2
3			0.5 - 2 - Sand (SP)		
4			Tan fgy sand, loose, moist.		
5					
6			Terminated @ 2' bgs		
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

1R85-TP03

SHEET 1 of 1

## TEST PIT LOG

PROJECT: 1R85

LOCATION: Camp Johnson

LOGGER: EMust

ELEVATION:

EXCAVATION EQUIPMENT USED: Deere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS:

Length: 16 ft

Width: 2 ft

Max. Depth: 2 ft

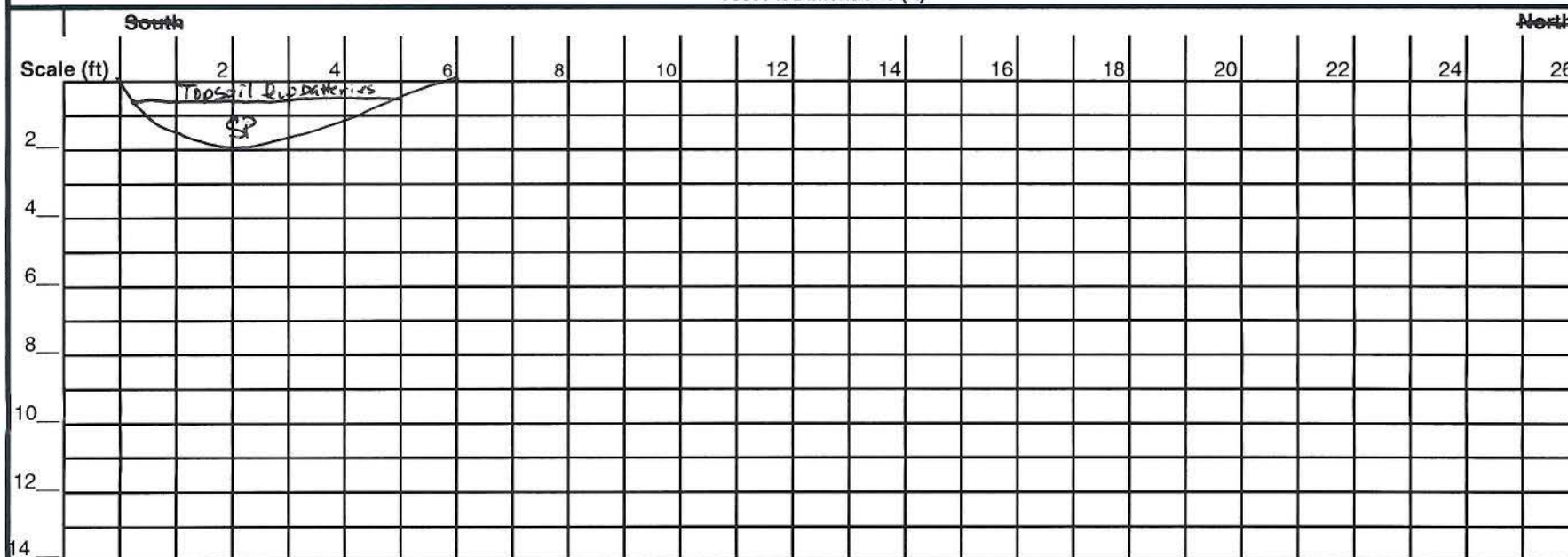
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis



**CH2MHILL**

PROJECT NUMBER

377812

TEST PIT NUMBER

TP03A

SHEET 1 OF 1

**TEST PIT LOG**

PROJECT: IRB5

LOCATION: Camp Johnson

LOGGER: Ernest

ELEVATION:

CONTRACTOR: SAEDACCO

EXCAVATION EQUIPMENT USED:

DATE EXCAVATED:

WATER LEVEL:

APPROX. DIMENS: Length:

6 ft

Width:

2 ft

Max. Depth:

2.5 ft

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS. OVM (ppm):      Headspace Analysis	
1			0.0 - 0.5 - Top soil, batteries at surface. DK grey	0.0	0-1 Bat @
2			loose, moist, silt & sand.	0.0	1-2 Surface.
3			0.5 - 2.5 - Sand (sp)		
4			Tan fgy sand, loose		
5			moist.		
6			Terminated @ 2.5' bge		
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

IR85-TP03A

SHEET 1 of 1

## TEST PIT LOG

PROJECT : IR85

LOCATION : Camp Johnson

LOGGER : E. Must / RDU

ELEVATION :

EXCAVATION EQUIPMENT USED : Deere 310g

DATE EXCAVATED :

WATER LEVEL : APPROX. DIMENS: Length: 6 ft Width: 2 ft Max. Depth: 2.5 ft

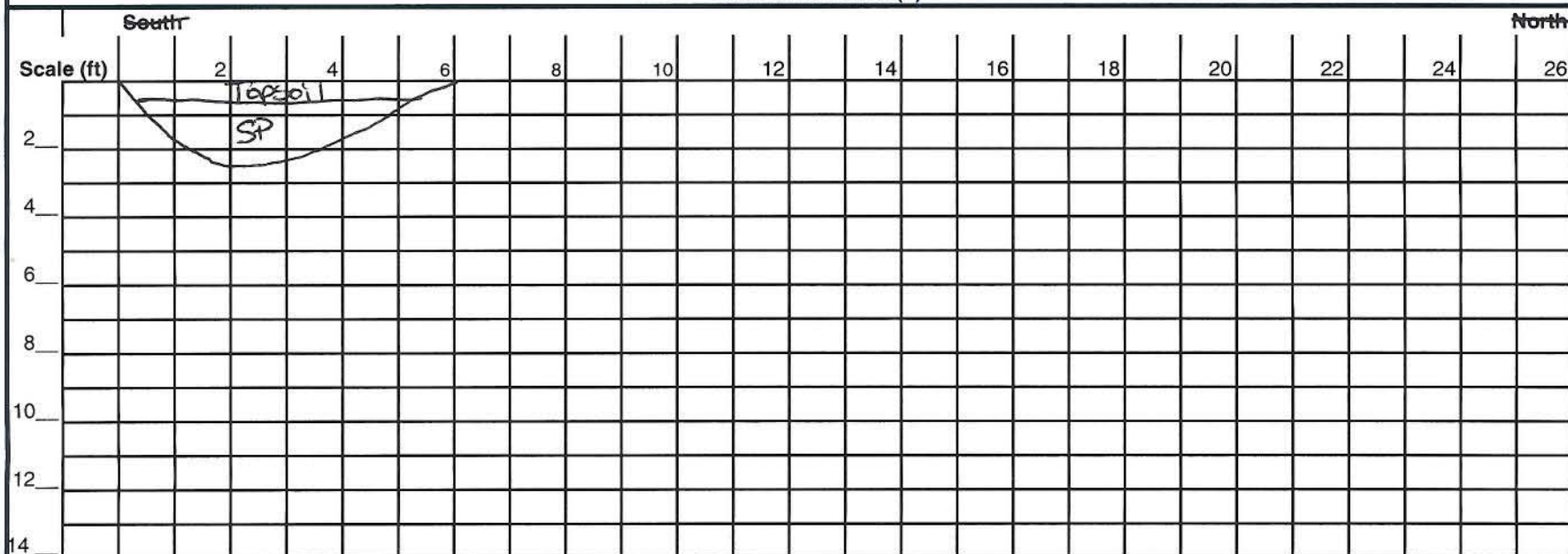
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

TP04

SHEET 1 OF 1

## TEST PIT LOG

PROJECT: IR85 LOCATION: Camp Johnson LOGGER: EMust  
ELEVATION: CONTRACTOR: SAEDACCO  
EXCAVATION EQUIPMENT USED: Deere 310g DATE EXCAVATED: 7/29/09  
WATER LEVEL: APPROX. DIMENS: Length: 6 Width: 2 Max. Depth: 1.5

DEPTH BELOW SURFACE (FT)	SAMPLE		SOIL DESCRIPTION	COMMENTS	
	INTERVAL	NUMBER AND TYPE	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.	OVM (ppm): Headspace Analysis
1			<del>0.0-0.25</del> 0.0-0.25 - Topsoil + 1 battery, dk grey loose moist, sand + silt	0.0	1 Battery on surface 0-1
2			0.25-1.5 - Sand (SP)		
3			Tan fg sand loose, moist.		
4			Terminated @ 1.5' bgs		
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					





CH2MHILL

PROJECT NUMBER

377812

TEST PIT NUMBER

1R85-TP04

SHEET 1 of 1

## TEST PIT LOG

PROJECT: 1R85

LOCATION: Camp Johnson

LOGGER: EMust/RDU

ELEVATION:

EXCAVATION EQUIPMENT USED: Doere 310g

DATE EXCAVATED: 7/29/09

WATER LEVEL:

APPROX. DIMENS: Length:

6 ft

Width: 2 ft

Max. Depth: 1.5 ft

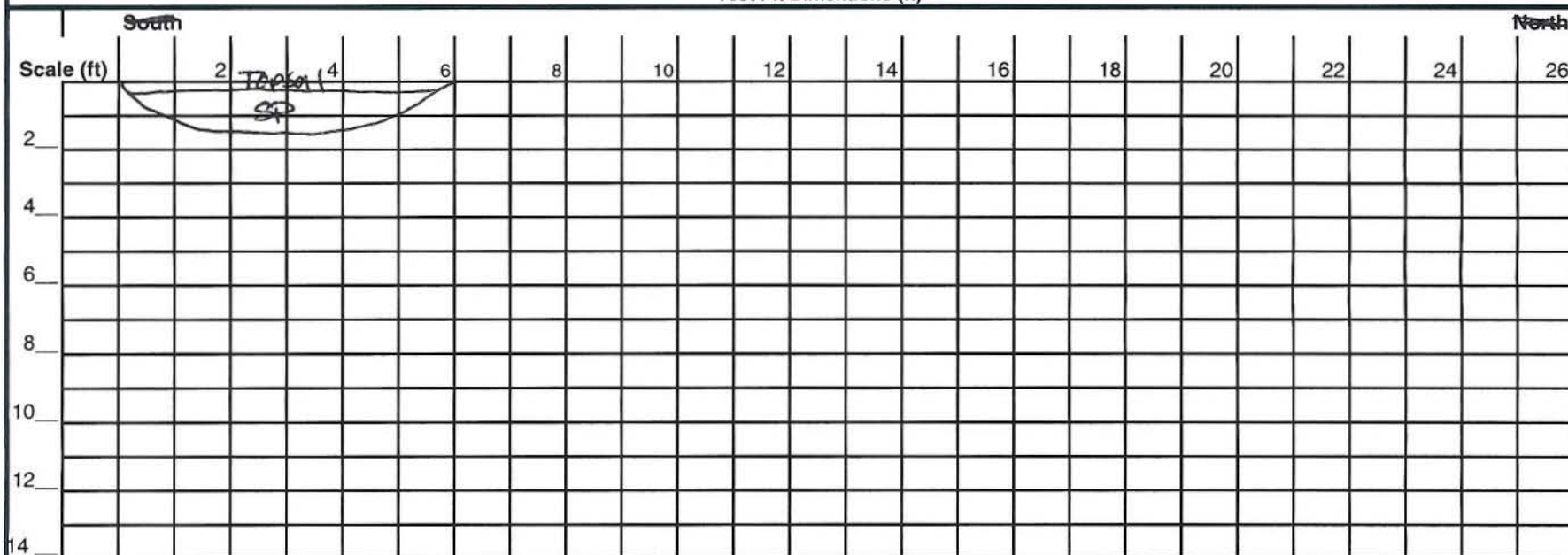
### SOIL DESCRIPTION

SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY

### COMMENTS

DIFFICULTY IN EXCAVATION, RUNNING GRAVEL CONDITION, COLLAPSE OF WALLS, SAND HEAVE, DEBRIS ENCOUNTERED, WATER SEEPAGE, GRADATIONAL CONTACTS, TESTS, INSTRUMENTS.

### Test Pit Dimensions (ft)



OVM (ppm): Headspace Analysis

OVM (ppm):

Breathing Zone Analysis





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-1  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CNSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

#### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 3 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR

FORT MILL SC 29707  
City or Town State Zip Code

(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-2

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_

(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC

City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KETI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC

City or Town State Zip Code

(704) 975-2980

Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 15 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 4 lb.

Type: Slurry Pellets X

Water 0.62 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROZCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS

Well Contractor (Individual) Name

SAEDACCO, INC.

Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR.

FORT MILL SC 29707

City or Town State Zip Code

(803) 548-2180

Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-3

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: TALLSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_

(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

TALLSONVILLE NC

City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KURT HALLBORG, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC

City or Town State Zip Code

(704) 975-2980

Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

Length

Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 8 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION:

0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

### Sand Cement

Cement \_\_\_\_\_ lb.

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 6 lb.

Type: Slurry Pellets X

Water 0.82 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED

7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS

Well Contractor (Individual) Name

SAEDACCO, INC.

Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR

FORT MILL SC 29707

City or Town State Zip Code

(803) 548-2180

Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-4

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use)

## 3. WELL LOCATION:

COUNTY ONslow QUADRANGLE NAME

NEAREST TOWN: JACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other

(Circle appropriate setting)

LATITUDE

LONGITUDE

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable)

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS

JACKSONVILLE NC

City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC

City or Town State Zip Code

(704) 975-2980

Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

Length

Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION:

0.16 15

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

### Sand Cement

Cement \_\_\_\_\_ lb.

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.

Type: Slurry Pellets X

Water 0.66 gal.

### Other

Type material

Amount

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED

7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-5

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAUBERG, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

Length

Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-6

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONslow QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KETI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CEMENT AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-7  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 8 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED.

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-8  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY CNSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 575-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 12 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION:

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 4 lb.  
Type: Slurry Pellets X  
Water 0.49 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this  
form showing total depth, depth and diameter of screens (if any) remaining  
in the well, gravel interval, intervals of casing perforations, and depths and  
types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-9  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CHSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_  
LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4820 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 02 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-10  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flai Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-11  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUD, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-12  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBURG, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 6 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR

FORT MILL SC 29707  
City or Town State Zip Code

(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-13

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: TACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_

(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

TACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 575-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.

Type: Slurry Pellets X

Water 0.66 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROD HOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-14  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CEMENT AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-15  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KURT HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROZEHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this  
form showing total depth, depth and diameter of screens (if any) remaining  
in the well, gravel interval, intervals of casing perforations, and depths and  
types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-16  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975 2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this  
form showing total depth, depth and diameter of screens (if any) remaining  
in the well, gravel interval, intervals of casing perforations, and depths and  
types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TWO-17  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY:

The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KETI HALLGREN, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROZCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM:

Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-18  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWGUD, CH2M HILL  
STREET ADDRESS 4820 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 17 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 2 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.7 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) - 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-19  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) - 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROCKHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this  
form showing total depth, depth and diameter of screens (if any) remaining  
in the well, gravel interval, intervals of casing perforations, and depths and  
types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-20  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROZCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-21  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBORD, CH2M HILL  
STREET ADDRESS 4820 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0.2 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOROHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(853) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-22  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 15 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 4 lb.  
Type: Slurry Pellets X  
Water 0.62 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-23  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CANSLW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBOD, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 6 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.79 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOROHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-24  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CHSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HALLBORG, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 575-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 19 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry \_\_\_\_\_ Pellets X  
Water 0.78 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-25  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL  
STREET ADDRESS 4820 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROCKHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-26  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CANLAW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY:

The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBURG, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16' ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 16 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 6.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM:

Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-27

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CNSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 575-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOROHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-28

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KURT HAWBUDG, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1" in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(853) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-29  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CHZM HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite S lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS

Well Contractor (Individual) Name

SAEDACCO INC.

Well Contractor Company Name

STREET ADDRESS 9688 NORTHFIELD DR

FORT MILL SC 29707

City or Town State Zip Code

(803) 548-2180

Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-30

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation

Other (list use)

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME

NEAREST TOWN: JACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other

(Circle appropriate setting)

LATITUDE

LONGITUDE

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information.)

FACILITY ID # (if applicable)

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS

JACKSONVILLE NC

City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC

City or Town State Zip Code

(704) 975-2980

Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 12' ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 4 lb.

Type: Slurry Pellets X

Water 0.49 gal.

#### Other

Type material

Amount

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-31  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.79 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS

Well Contractor (Individual) Name

SAEDACCO INC.

Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR

FORT MILL SC 29707

City or Town State Zip Code

(803) 548-2180

Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-32

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONslow QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBORD, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-33

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: TALLSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

TALLSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KETI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 575-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.79 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BURCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-34

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONslow QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FOR7 MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-35  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

LONGITUDE \_\_\_\_\_

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

### 4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

### 10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-36  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CANSLAW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b. well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWGUE, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 22 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.9 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this  
form showing total depth, depth and diameter of screens (if any) remaining  
in the well, gravel interval, intervals of casing perforations, and depths and  
types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE  
WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF  
THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well  
in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-37  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOROHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-38

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

#### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(853) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-39  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CNSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KURT HAWGUE, CHZM HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-40  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBEGG, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter  
a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-41  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBROOK, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 2 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 16

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.79 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOROHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-42

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 18 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

6. CASING: Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.74 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BURCHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-43  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBORD, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLDG  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name  
SAEDACCO, INC.  
Well Contractor Company Name  
STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-44  
STATE WELL PERMIT # (if applicable) \_\_\_\_\_  
COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_  
DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_  
WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_  
NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON  
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)  
TOPOGRAPHIC / LAND SETTING:  
Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_  
LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map  
(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_  
NAME OF FACILITY CAMP JOHNSON  
STREET ADDRESS \_\_\_\_\_  
JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBROOK, CH2M HILL  
STREET ADDRESS 4824 PARKWAY PLAZA BLVD  
CHARLOTTE NC  
City or Town State Zip Code  
(704) 775-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 20 ft. Diameter: 1 in.  
b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.  
b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.16 lb

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 6 lb.  
Type: Slurry Pellets X  
Water 0.82 gal.

#### Other

Type material \_\_\_\_\_  
Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BORHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR.

FORT MILL SC 29707  
City or Town State Zip Code

(803) 548 2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-45

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4820 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 17 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 16 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION:

0.16

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.7 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-46

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONslow QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KORI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 17 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.7 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BUZZHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

10/13/09  
DATE

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C.0113.)

TIM THOMAS  
PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR.  
FORT MILL SC 29707  
City or Town State Zip Code  
(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW - 47

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY: The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KETI HAWKINS, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.  
Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

a. Casing Depth (if known): \_\_\_\_\_ ft. 1 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1616

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





# WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

## 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR.

FORT MILL SC 29707  
City or Town State Zip Code

(803) 548-2180  
Area code - Phone number

## 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-48

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

## 3. WELL LOCATION:

COUNTY ONSLOW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: JACKSONVILLE, NC  
CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

## TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_  
(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

JACKSONVILLE NC  
City or Town State Zip Code

## 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBUGH, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC  
City or Town State Zip Code

(704) 975-2980  
Area code - Phone number

## 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

## 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 0 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

## 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

## 8. SEALING MATERIAL:

### Neat Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Sand Cement

Cement \_\_\_\_\_ lb.  
Water \_\_\_\_\_ gal.

### Bentonite

Bentonite 5 lb.  
Type: Slurry Pellets X  
Water 0.66 gal.

### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

## 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

ROD HOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

## 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





## WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2012

### 1. WELL CONTRACTOR:

TIM THOMAS  
Well Contractor (Individual) Name

SAEDACCO, INC.  
Well Contractor Company Name

STREET ADDRESS 9088 NORTHFIELD DR.

FORT MILL SC 29707  
City or Town State Zip Code

(803) 548-2180  
Area code - Phone number

### 2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-49

STATE WELL PERMIT # (if applicable) \_\_\_\_\_

COUNTY WELL PERMIT # (if applicable) \_\_\_\_\_

DWQ or OTHER PERMIT # (if applicable) \_\_\_\_\_

WELL USE (Circle applicable use): Monitoring Residential  
Municipal/Public Industrial/Commercial Agricultural  
Recovery Injection Irrigation  
Other (list use) \_\_\_\_\_

### 3. WELL LOCATION:

COUNTY CANLAW QUADRANGLE NAME \_\_\_\_\_

NEAREST TOWN: TACKSONVILLE, NC

CAMP JOHNSON

(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

### TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other \_\_\_\_\_

(Circle appropriate setting)

LATITUDE \_\_\_\_\_

LONGITUDE \_\_\_\_\_

May be in degrees,  
minutes, seconds, or in a  
decimal format

Latitude/longitude source: GPS Topographic map

(Location of well must be shown on a USGS topo map and  
attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and 4b.  
(If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID # (if applicable) \_\_\_\_\_

NAME OF FACILITY CAMP JOHNSON

STREET ADDRESS \_\_\_\_\_

TACKSONVILLE NC

City or Town State Zip Code

### 4b. CONTACT PERSON/WELL OWNER:

NAME KERI HAWBROOK, CH2M HILL

STREET ADDRESS 4824 PARKWAY PLAZA BLVD

CHARLOTTE NC

City or Town State Zip Code

(704) 975-2980

Area code - Phone number

### 5. WELL DETAILS:

a. Total Depth: 16 ft. Diameter: 1 in.

b. Water Level (Below Measuring Point): \_\_\_\_\_ ft.

Measuring point is \_\_\_\_\_ ft. above land surface.

### 6. CASING:

Length Diameter

a. Casing Depth (if known): \_\_\_\_\_ ft. 4 in.

b. Casing Removed: \_\_\_\_\_ ft. \_\_\_\_\_ in.

### 7. DISINFECTION: 0.1615

(Amount of 65%-75% calcium hypochlorite used)

### 8. SEALING MATERIAL:

#### Neat Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

#### Sand Cement

Cement \_\_\_\_\_ lb.

Water \_\_\_\_\_ gal.

#### Bentonite

Bentonite 5 lb.

Type: Slurry Pellets X

Water 0.66 gal.

#### Other

Type material \_\_\_\_\_

Amount \_\_\_\_\_

### 9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

BOREHOLE WAS FILLED WITH CHIPS AFTER  
WELL WAS REMOVED

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

### 11. DATE WELL ABANDONED 7/29/09

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR

DATE 10/13/09

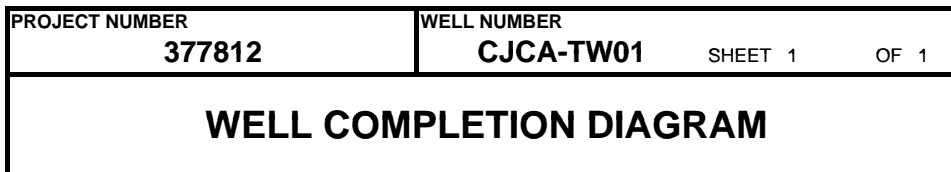
SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL DATE

(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

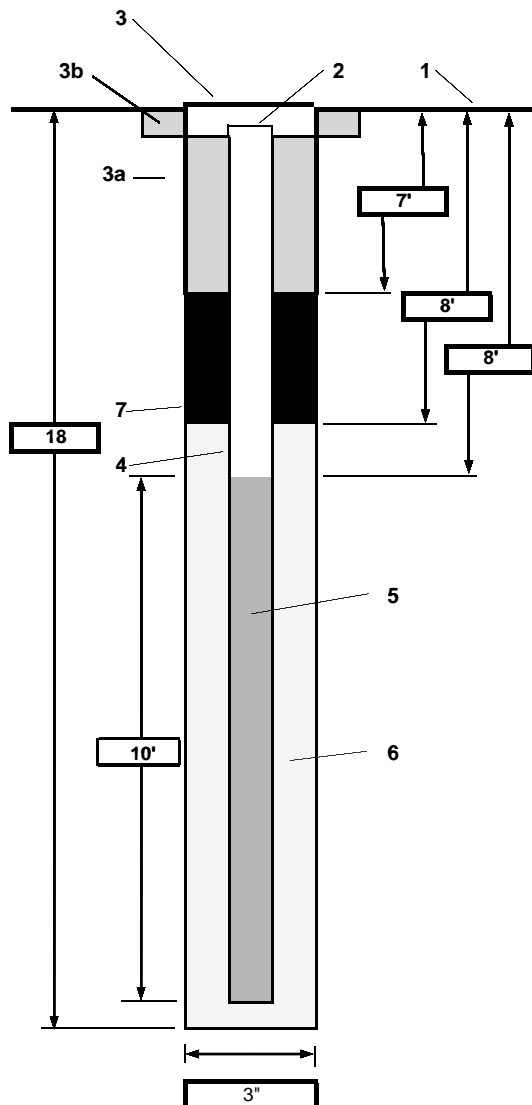
TIM THOMAS

PRINTED NAME OF PERSON ABANDONING THE WELL





LOGGER : Daniel Brown



- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 1- Ground elevation at well       | 19.700                                |
| 2- Top of casing elevation        | 21.70                                 |
| 3- Wellhead protection cover type |                                       |
| a) drain tube?                    |                                       |
| b) concrete pad dimensions        |                                       |
| 4- Dia./type of well casing       | 1" Schedule PVC 40                    |
| 5- Type/slot size of screen       | pre-packed 0.01" Slot PVC Schedule 40 |
| 6- Type screen filter             | #2 sand                               |
| a) Quantity used                  | 1(50 lb) bag                          |
| 7- Type of seal                   | 3/8" Bentonite Holeplug               |
| a) Quantity used                  |                                       |
| Development method                | Peristaltic pump                      |
| Development time                  | 1 hour                                |
| Estimated purge volume            | 9.5 gals                              |
| Comments:                         |                                       |





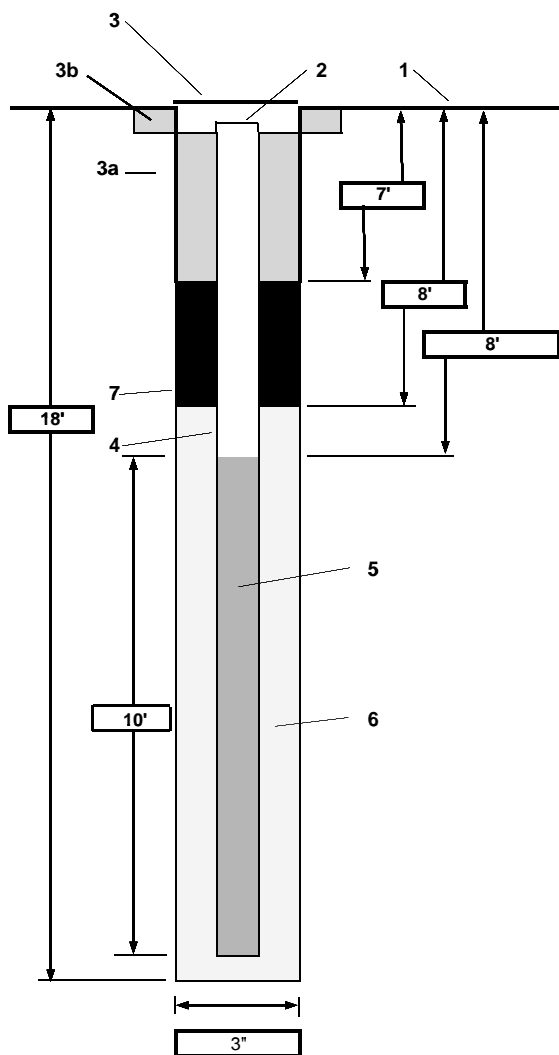
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW02</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 9.46' btoc START : 7/26/2009 9:35: AM LOGGER : Daniel Brown



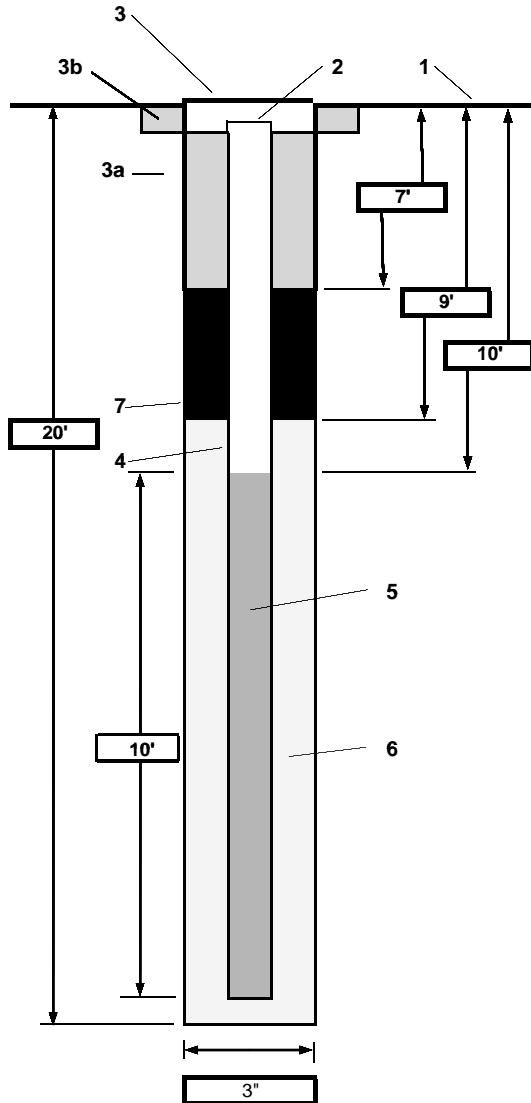
1- Ground elevation at well	<u>18.27</u>
2- Top of casing elevation	<u>20.19</u>
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	<u>1" Schedule PVC 40</u>
5- Type/slot size of screen	<u>pre-packed 0.01" Slot PVC Schedule 40</u>
6- Type screen filter	<u>Type 2 sand</u>
a) Quantity used	<u>1(50 lb) bag</u>
7- Type of seal	<u>3/8" Bentonite Holeplug</u>
a) Quantity used	
Development method	<u>Peristaltic pump</u>
Development time	<u>1 hour</u>
Estimated purge volume	<u>8 gals</u>
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW03</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 15.92' botc	START : 7/26/2009 1435
LOGGER : S. Beville	



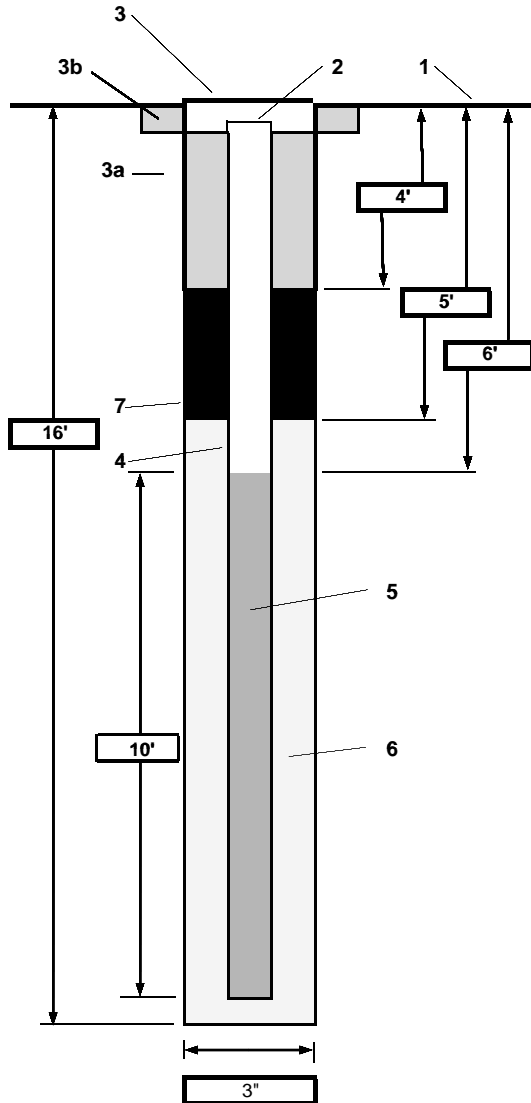
1- Ground elevation at well	19.012
2- Top of casing elevation	19.570
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW04</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 12.08' btoc	START : 7/26/09 1025
LOGGER : S. Beville	



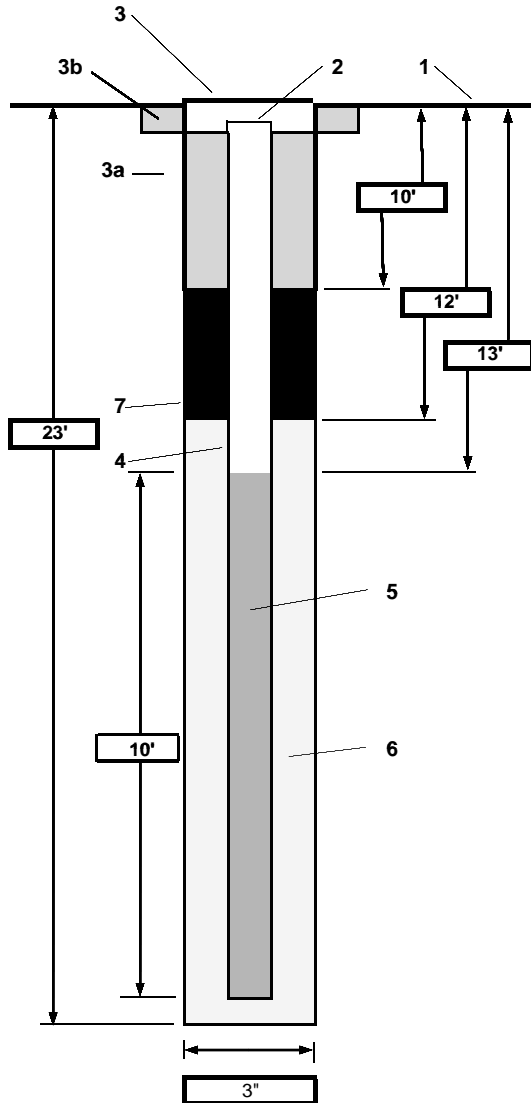
1- Ground elevation at well	22.62
2- Top of casing elevation	23.58
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	30 minutes
Estimated purge volume	2 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW05</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 16.35' btoc	START : 7/26/09 0820
LOGGER : S. Beville	



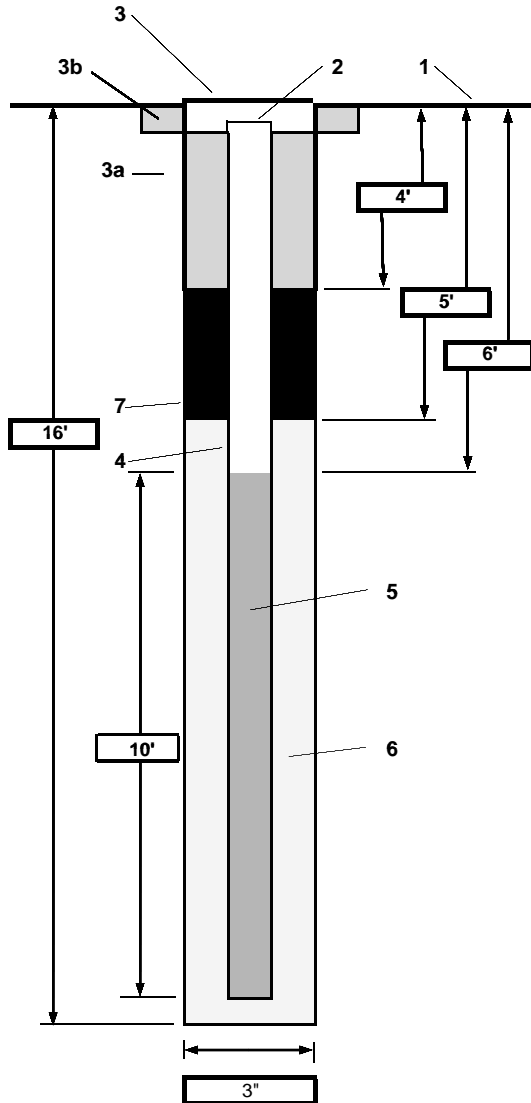
1- Ground elevation at well	20.10
2- Top of casing elevation	21.24
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW06</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 13.81' btoc START : 7/26/09 1235 LOGGER : S. Beville



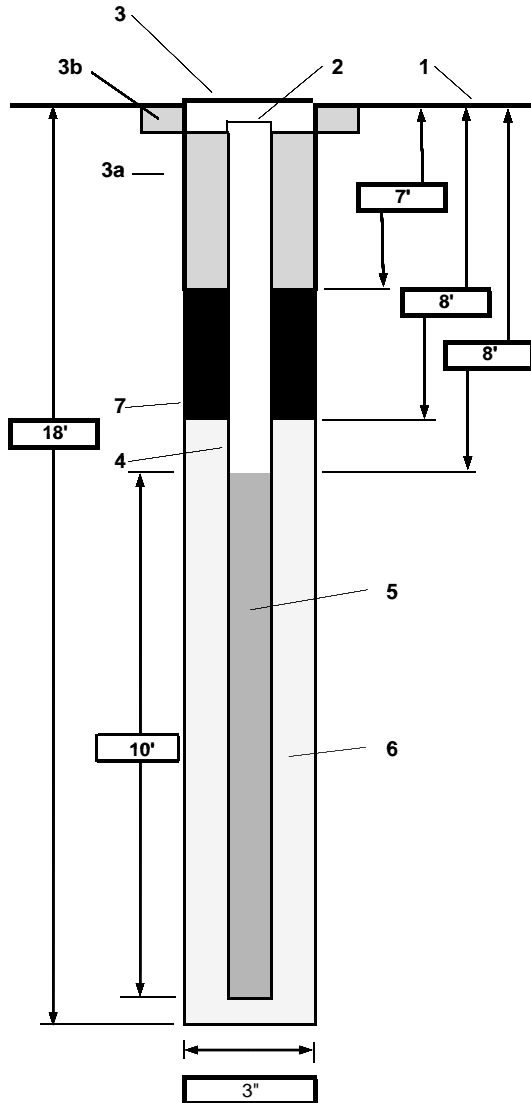
1- Ground elevation at well	17.62
2- Top of casing elevation	18.56
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	3 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW08</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 11.25' btoc	START : 7/25/2009 1650
LOGGER : Daniel Brown	



1- Ground elevation at well	12.92
2- Top of casing elevation	14.47
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1/2 (50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gsals
Comments:	





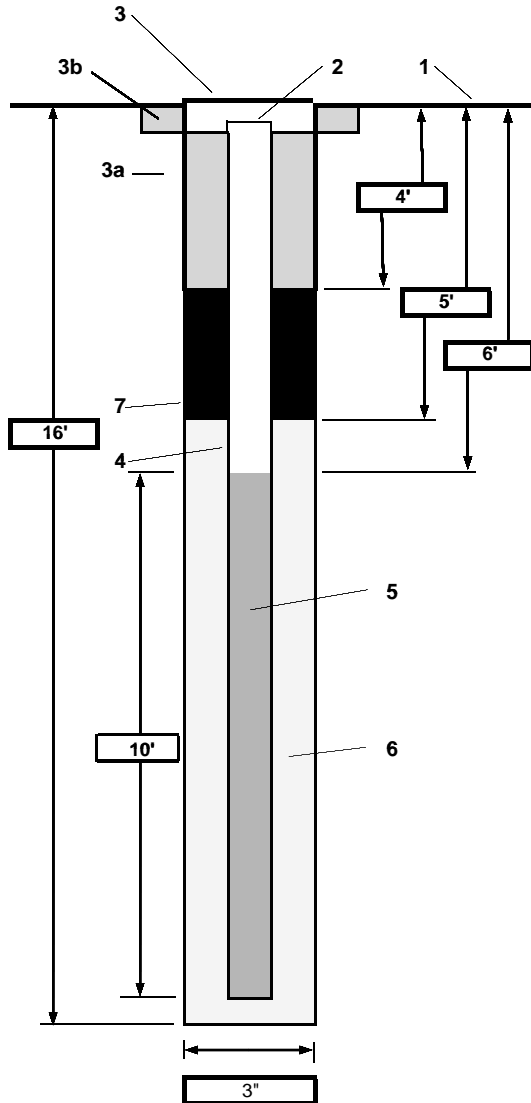
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW09</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.01' botc START : 7/25/09 1030 LOGGER : S. Beville



1- Ground elevation at well 14.03

2- Top of casing elevation 15.27

3- Wellhead protection cover type  
a) drain tube?  
b) concrete pad dimensions

4- Dia./type of well casing 1" Schedule PVC 40

5- Type/slot size of screen pre-packed 0.01" Slot PVC Schedule 40

6- Type screen filter  
a) Quantity used  
Type 2 sand  
1(50 lb) bag

7- Type of seal  
a) Quantity used  
3/8" Bentonite Holeplug

Development method Peristaltic pump

Development time 1 hour

Estimated purge volume 8 gals

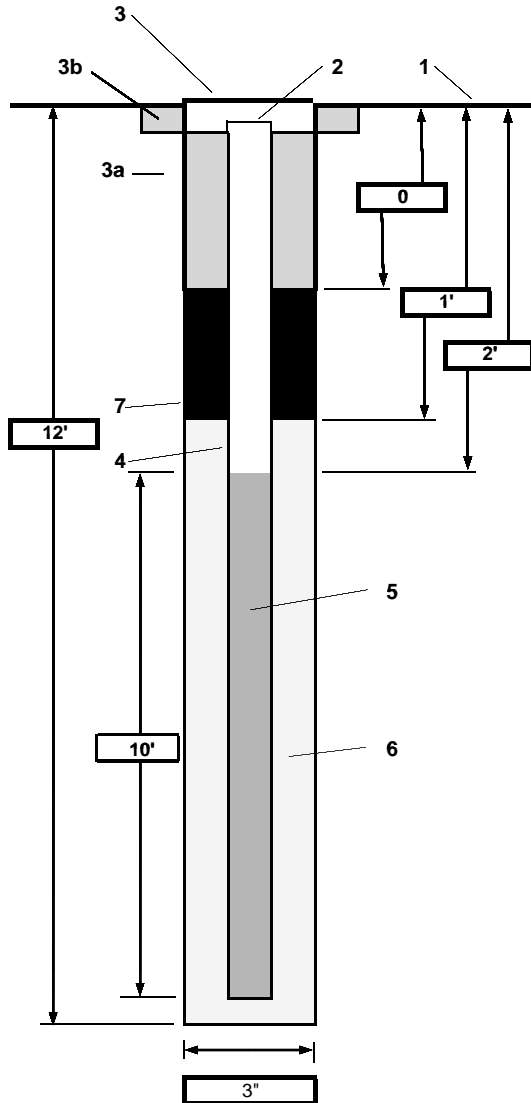
Comments:





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW10</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 4.41' btoc	START : 7/25/2009 1310
LOGGER : S. Beville	



1- Ground elevation at well	25.60
2- Top of casing elevation	26.77
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1.5 hours
Estimated purge volume	8 gals
Comments:	





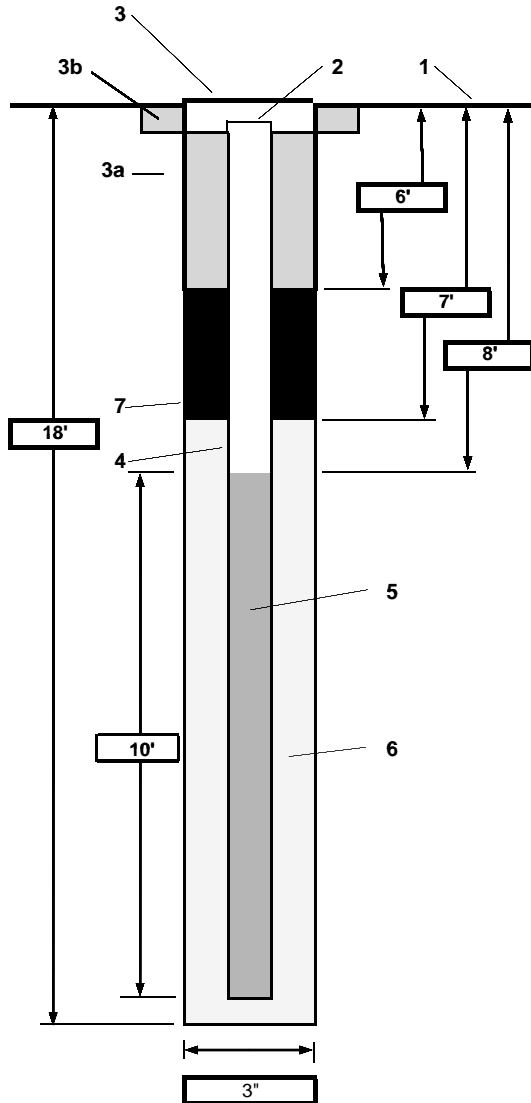
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW11</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 9.46' btoc START : 7/25/2009 1600 LOGGER : S. Beville



1- Ground elevation at well	13.41
2- Top of casing elevation	14.70
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	4 gals
Comments:	





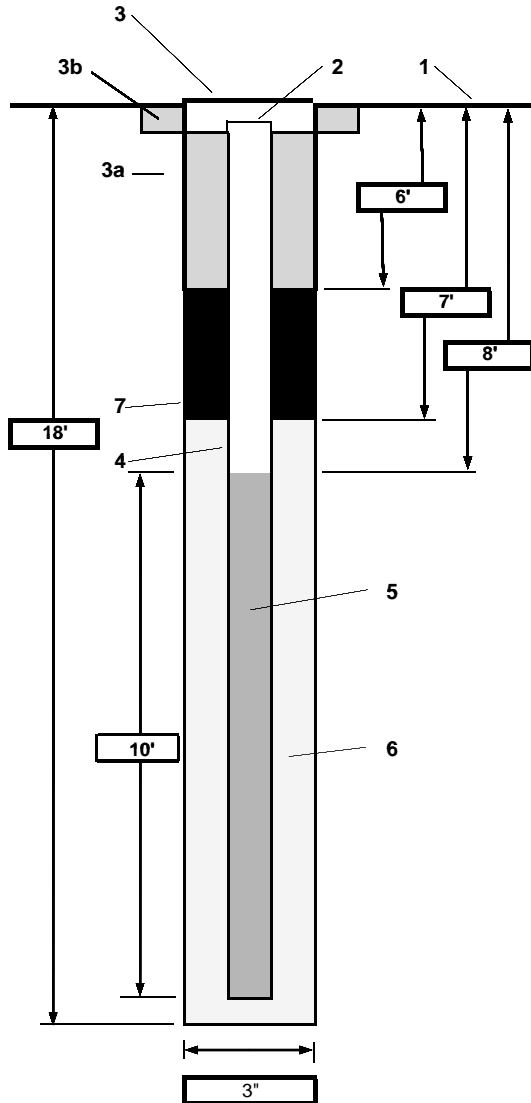
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW12</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.30 btoc START : 7/25/2009 0830 LOGGER : S. Beville



1- Ground elevation at well	14.97
2- Top of casing elevation	16.26
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	6 gals
Comments:	





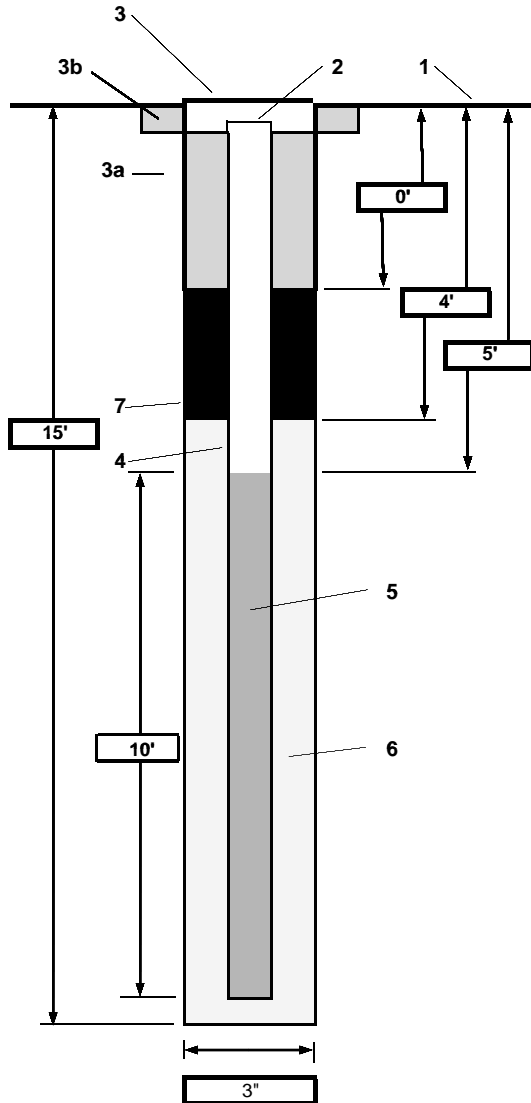
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW13</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 7.69 btoc START : 7/24/2009 0925 LOGGER : S. Beville



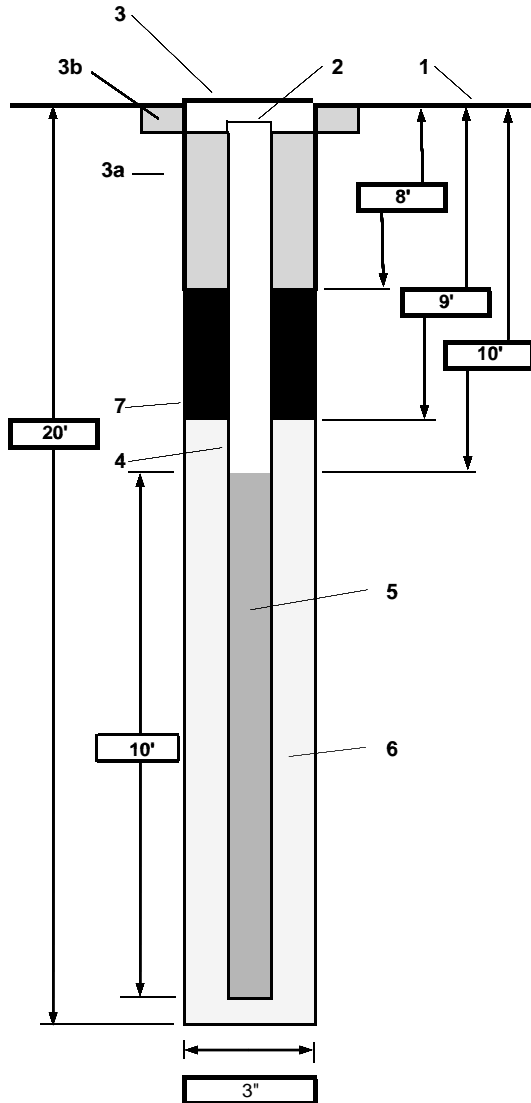
1- Ground elevation at well	12.27
2- Top of casing elevation	13.64
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW14</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 10.67 btoc	START : 7/23/2009 1655
LOGGER : S. Beville	



1- Ground elevation at well	15.07
2- Top of casing elevation	15.71
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





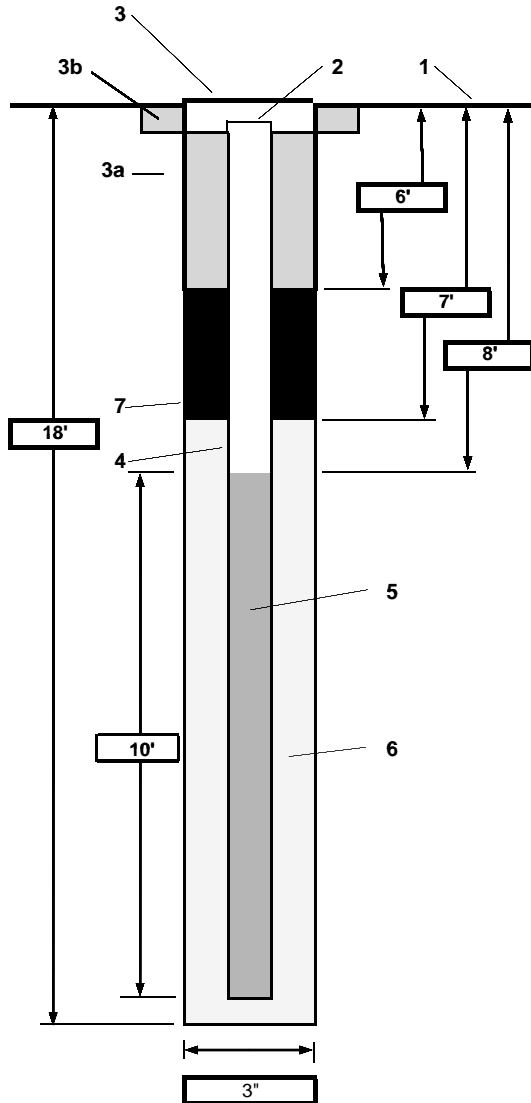
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW15</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.81' btoc START : 7/23/2009 1415 LOGGER : S. Beville



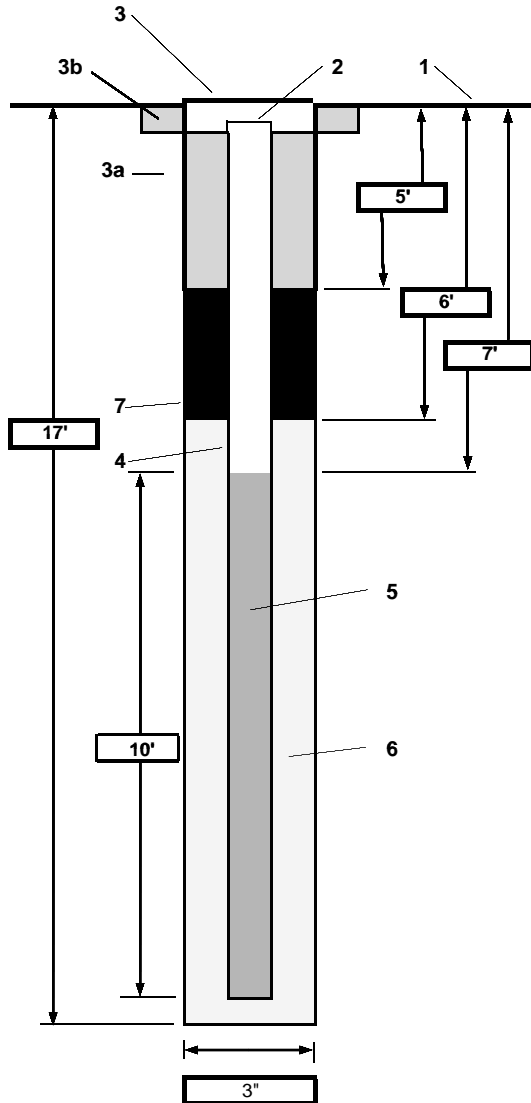
1- Ground elevation at well	17.32
2- Top of casing elevation	18.55
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	15 minutes
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW16</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 10.42' btoc	START : 7/23/2009 1205
LOGGER : S. Beville	



1- Ground elevation at well	11.61
2- Top of casing elevation	12.23
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





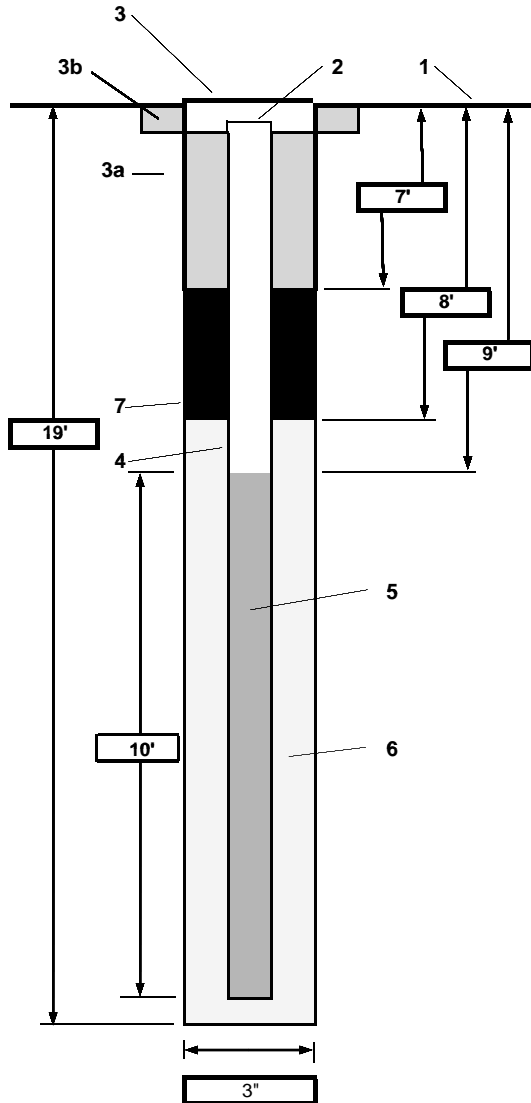
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW17</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.41' btoc START : 7/22/2009 1315 LOGGER : S. Beville



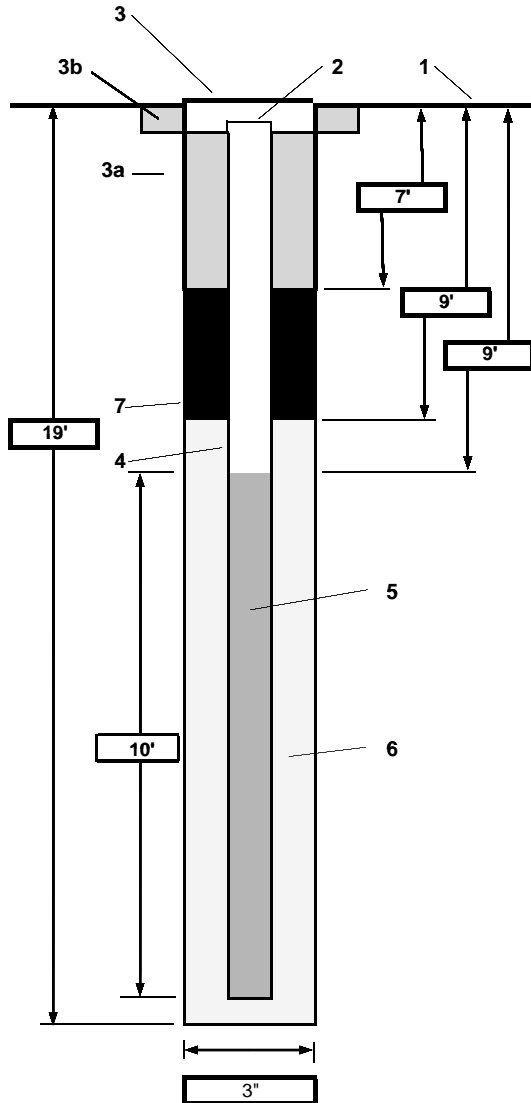
1- Ground elevation at well	8.23
2- Top of casing elevation	9.57
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <div style="text-align: center; font-weight: bold;">377812</div>	WELL NUMBER <div style="text-align: center; font-weight: bold;">CJCA-TW18</div>
SHEET 1 OF 1	
<div style="font-size: 1.2em; font-weight: bold;">WELL COMPLETION DIAGRAM</div>	

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC	
DRILLING CONTRACTOR : SAEDACCO		
DRILLING METHOD AND EQUIPMENT USED : DPT		
WATER LEVELS : 9.60' btoc	START : 7/23/2009 0815	LOGGER : Daniel Brown



1- Ground elevation at well	14.301
2- Top of casing elevation	15.520
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1/2 (50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	12 gals
Comments:	





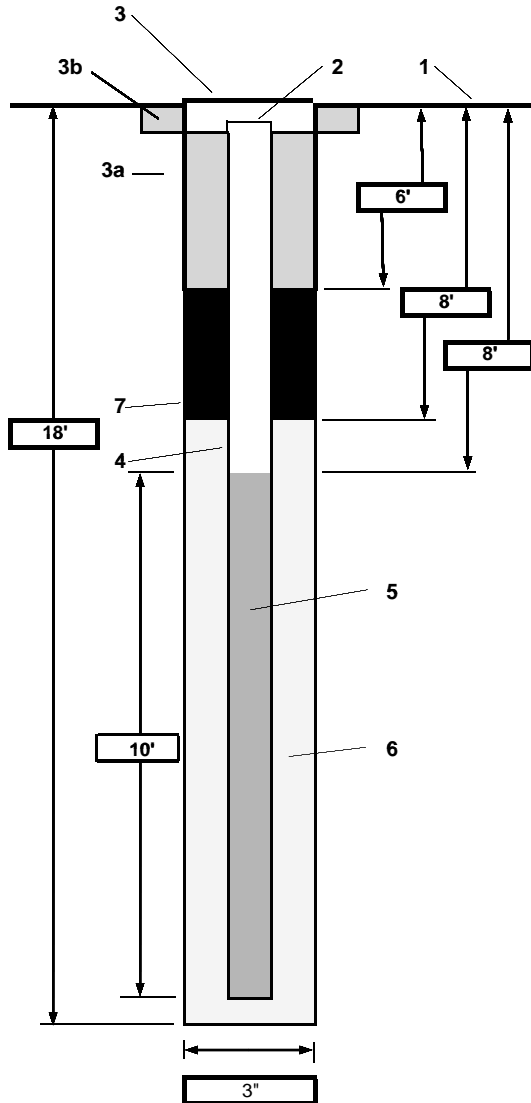
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW19</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 12.42' btoc START : 7/24/2009 0915 LOGGER : Daniel Brown



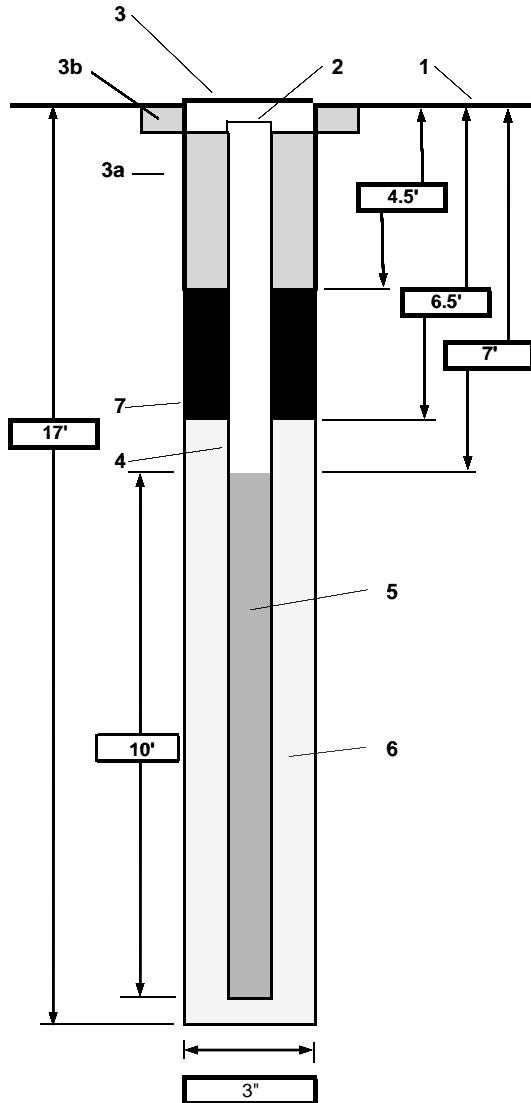
1- Ground elevation at well	23.37
2- Top of casing elevation	25.43
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW20</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 11.70' btoc	START : 7/23/2009 1640
LOGGER : Daniel Brown	



1- Ground elevation at well	12.39
2- Top of casing elevation	15.65
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





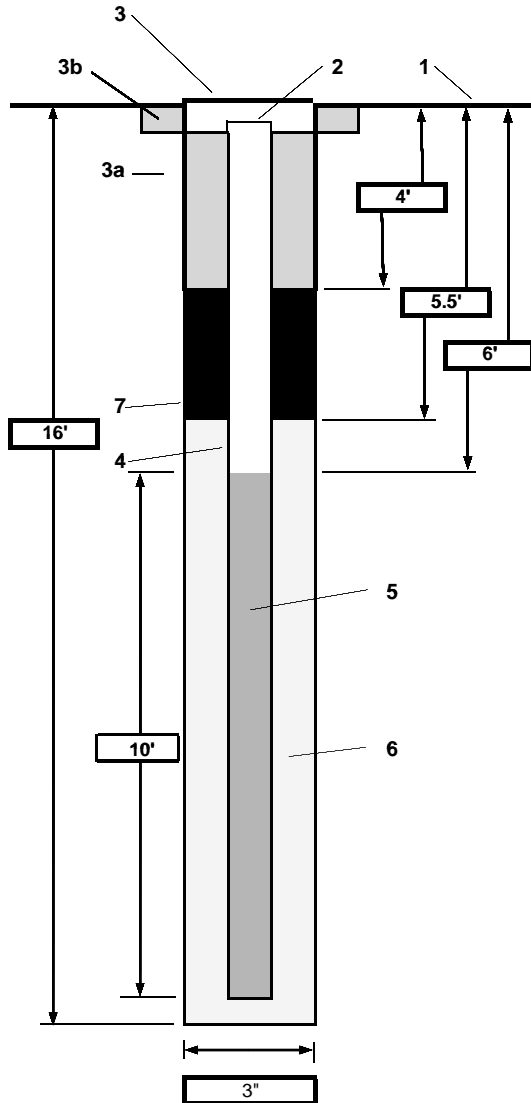
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW21</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 8.47' btoc START : 7/25/2009 1005 LOGGER : Daniel Brown



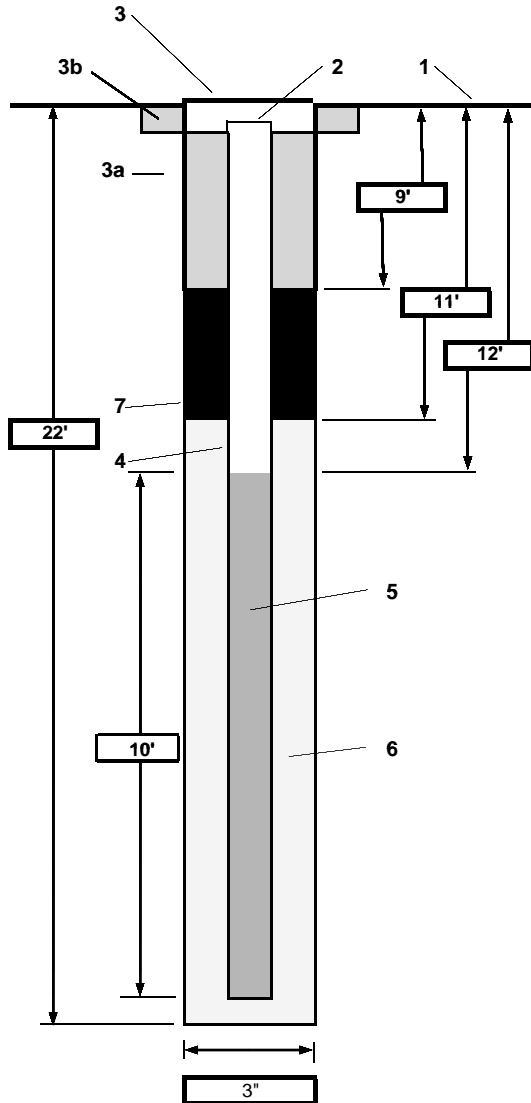
1- Ground elevation at well	11.34
2- Top of casing elevation	13.33
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW22</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 9.91' btoc	START : 7/22/2009 1555
	LOGGER : S. Beville



1- Ground elevation at well	20.52
2- Top of casing elevation	22.31
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	3 hours
Estimated purge volume	30 gals
Comments:	





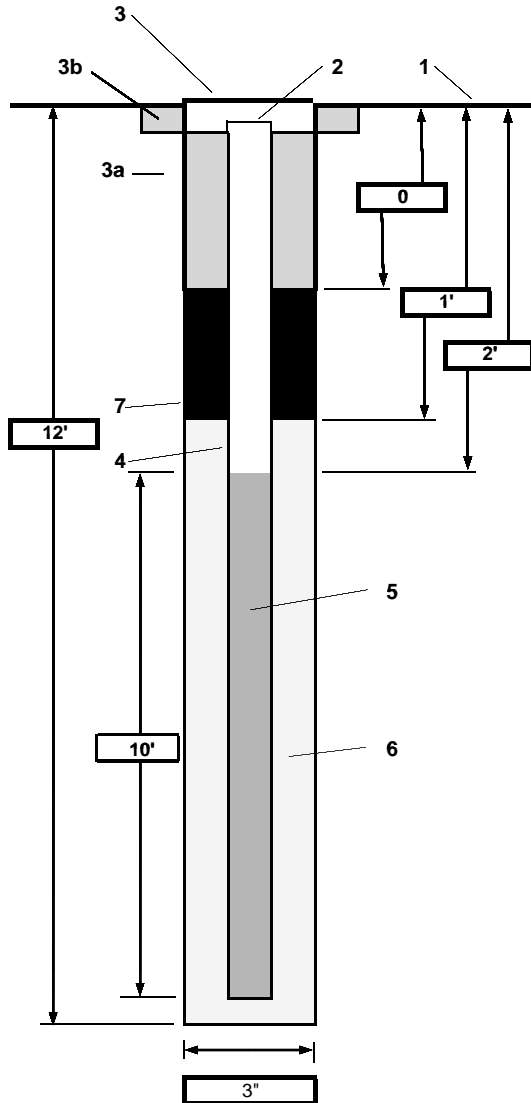
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW23</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 4.80' btoc START : 7/22/2009 1435 LOGGER : S.Beville



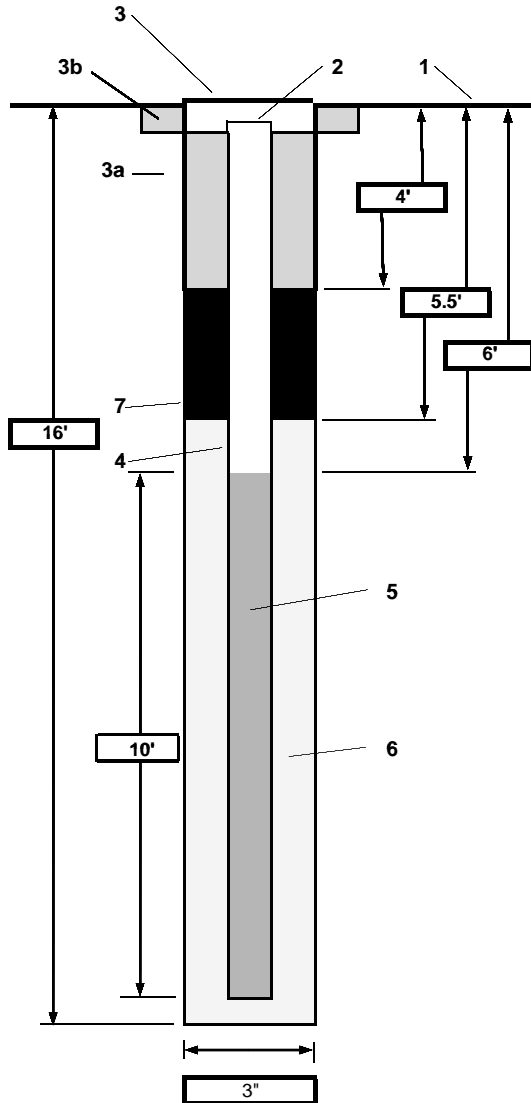
1- Ground elevation at well	8.72
2- Top of casing elevation	10.29
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	2 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW24</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 8.47' btoc START : 7/25/2009 1005 LOGGER : Daniel Brown



1- Ground elevation at well 27.34  
 2- Top of casing elevation 28.35  
 3- Wellhead protection cover type  
 a) drain tube? \_\_\_\_\_  
 b) concrete pad dimensions \_\_\_\_\_  
 4- Dia./type of well casing 1" Schedule PVC 40  
 5- Type/slot size of screen p re-packed 0.01" Slot PVC Schedule 40  
 6- Type screen filter  
 a) Quantity used Type 2 sand  
1/2 (50 lb) bag  
 7- Type of seal  
 a) Quantity used 3/8" Bentonite Holeplug  
Development method Peristaltic pump  
Development time 1 hour  
Estimated purge volume N/A  
 Comments:





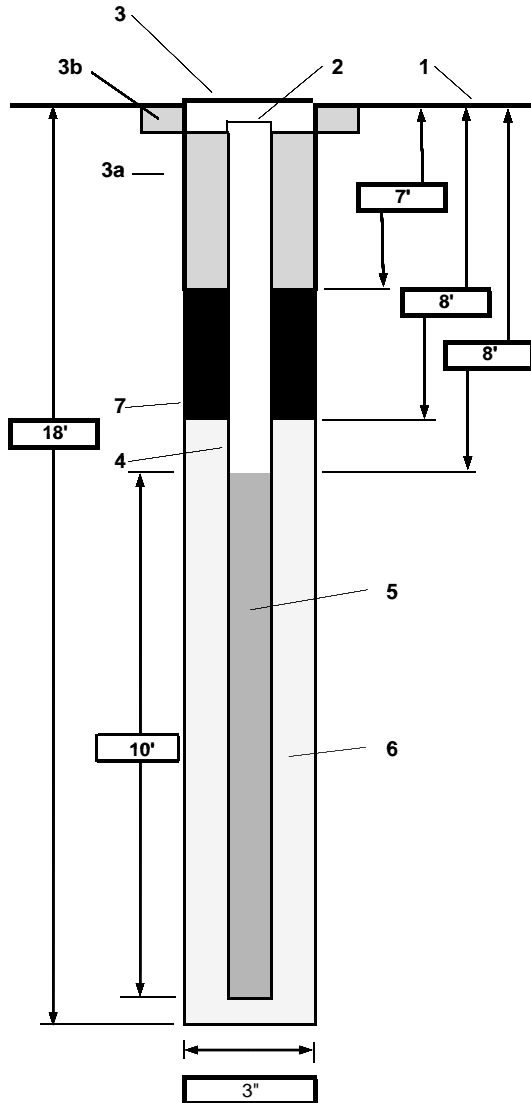
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW25</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.35' btoc START : 7/25/2009 1505 LOGGER : Daniel Brown



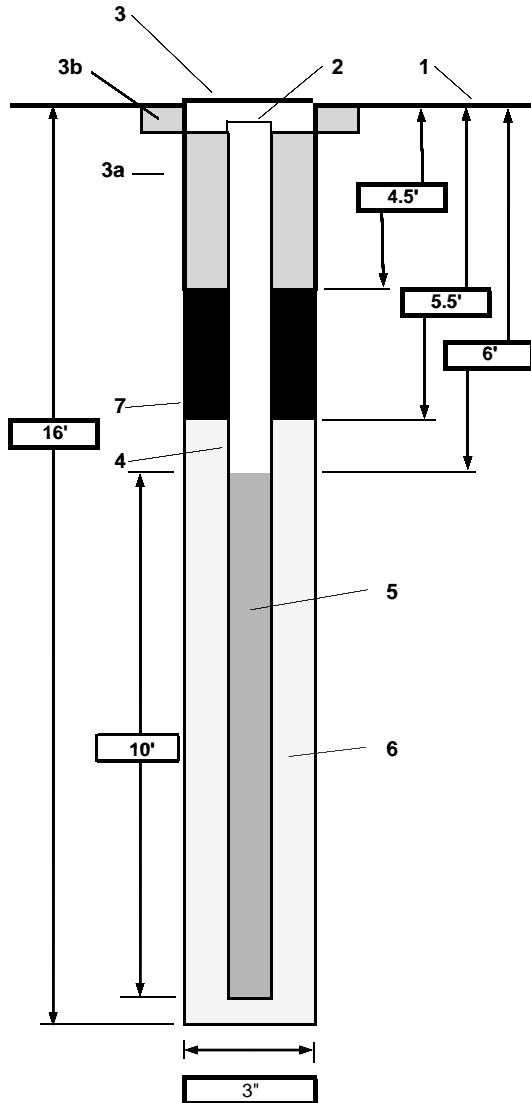
1- Ground elevation at well	13.04
2- Top of casing elevation	15.04
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pr e-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	4 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW26</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 6.24' btoc	START : 7/25/2009 1130
LOGGER : Daniel Brown	



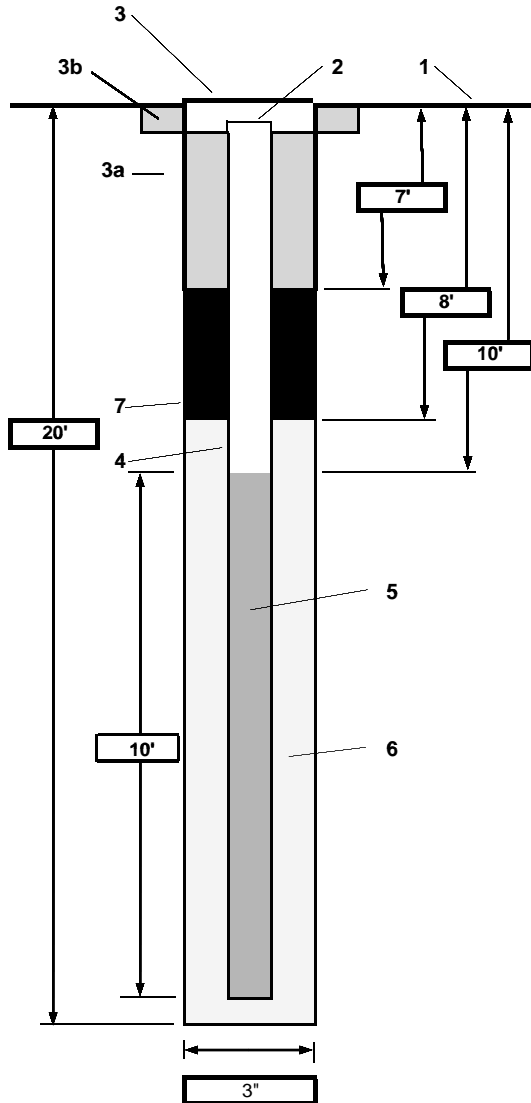
1- Ground elevation at well	6.89
2- Top of casing elevation	9.32
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1/2 (50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1.5 hours
Estimated purge volume	30 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW27</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 15.60' btoc START : 7/22/2009 0900 LOGGER : Daniel Brown



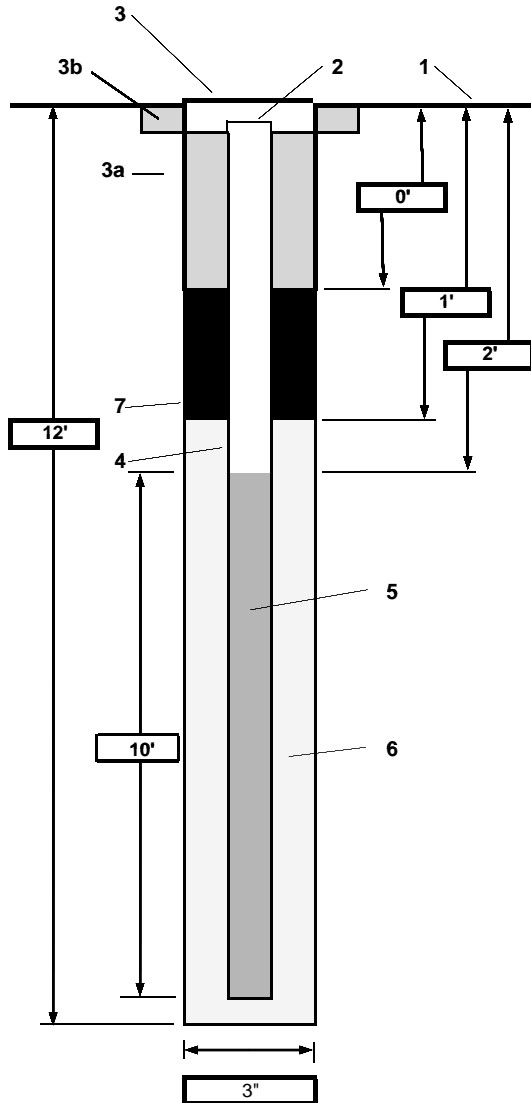
1- Ground elevation at well	10.84
2- Top of casing elevation	12.53
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1 (50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	5 inutes
Estimated purge volume	0.25 gals
Comments: purged dry	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW28</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 4.96' btoc START : 7/21/2009 LOGGER : D Brown



1- Ground elevation at well	2.89
2- Top of casing elevation	4.73
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





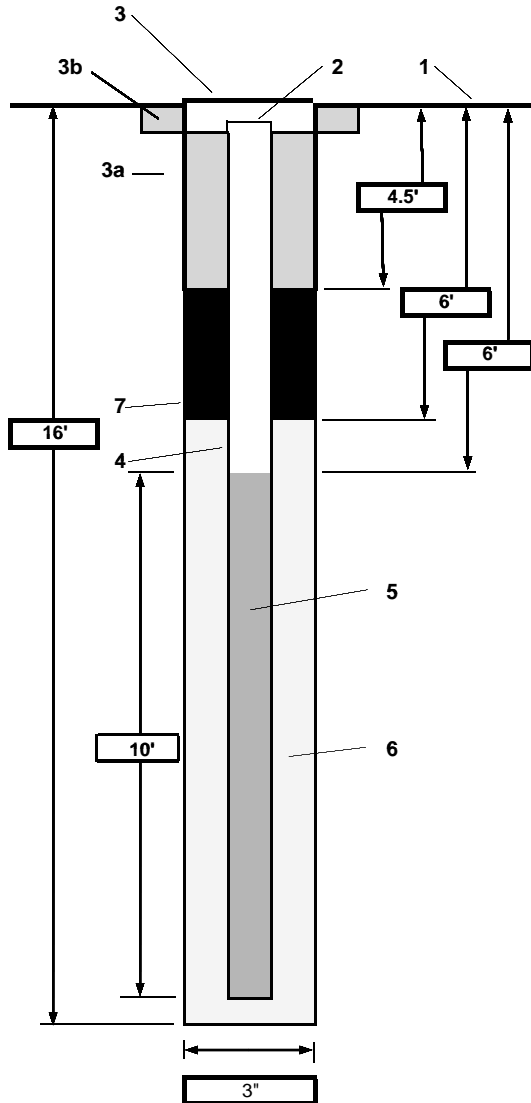
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW29</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 13.58' btoc START : 7/23/2009 1145 LOGGER : Daniel Brown



1- Ground elevation at well	14.06
2- Top of casing elevation	16.18
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	p re-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





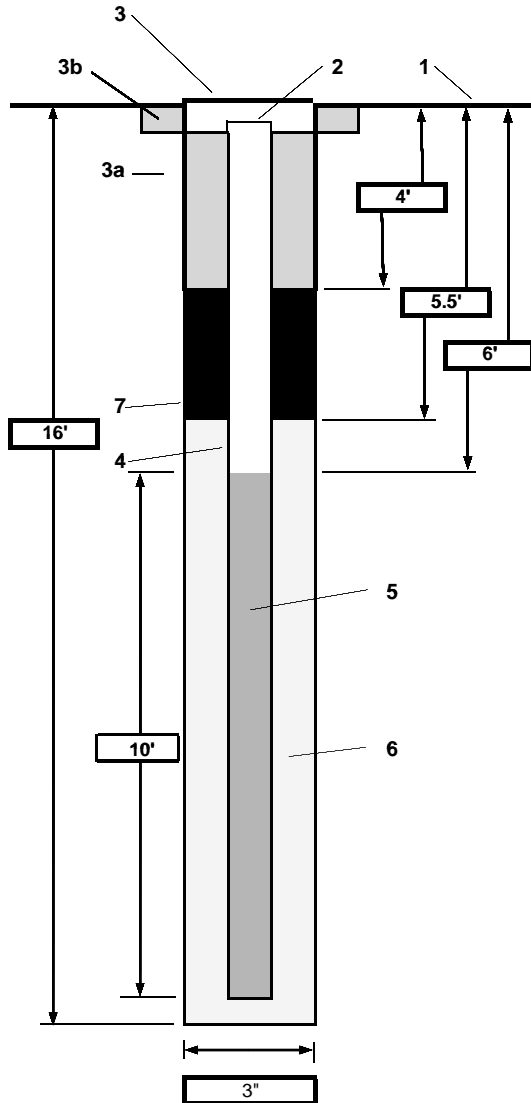
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW30</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.79' btoc START : 7/23/2009 1335 LOGGER : Daniel Brown



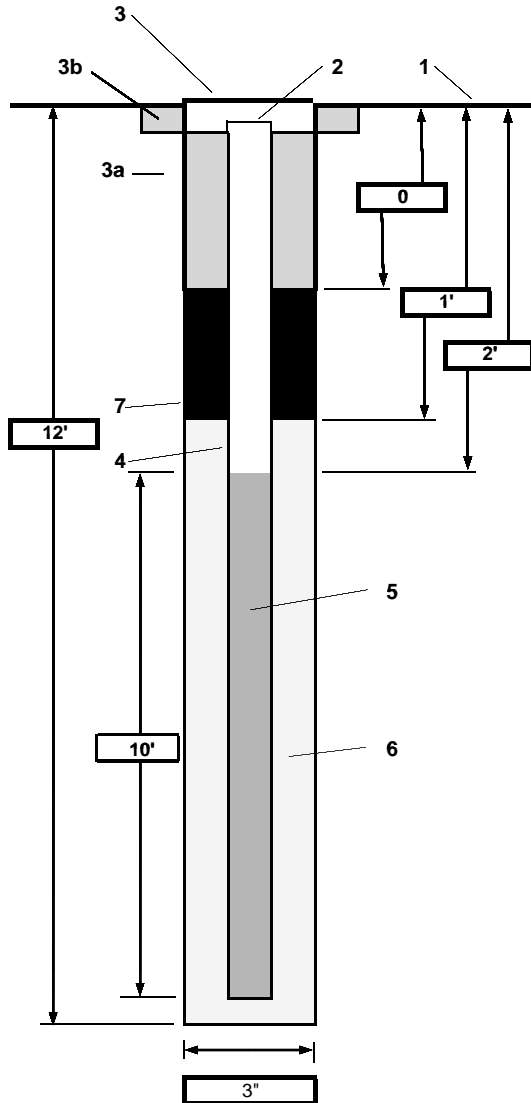
- 1- Ground elevation at well 10.53
- 2- Top of casing elevation 12.79
- 3- Wellhead protection cover type  
a) drain tube?   
b) concrete pad dimensions
- 4- Dia./type of well casing 1" Schedule PVC 40
- 5- Type/slot size of screen p re-packed 0.01" Slot PVC Schedule 40
- 6- Type screen filter  
a) Quantity used Type 2 sand  
1(50 lb) bag
- 7- Type of seal  
a) Quantity used 3/8" Bentonite Holeplug
- Development method Peristaltic pump
- Development time 1.5 hour
- Estimated purge volume 3 gals
- Comments:





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW31</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 8.79' btoc	START : 7/22/2009 0910
LOGGER : Daniel Brown	



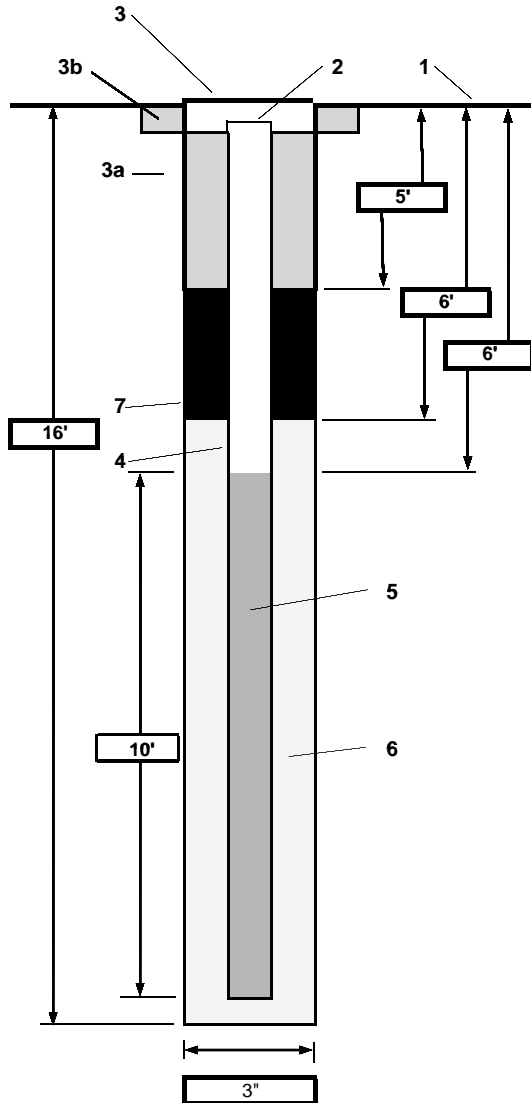
1- Ground elevation at well	6.634
2- Top of casing elevation	9.120
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW32</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 10.68' btoc	START : 7/23/2009 0940
LOGGER : Daniel Brown	



1- Ground elevation at well	12.79
2- Top of casing elevation	13.99
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





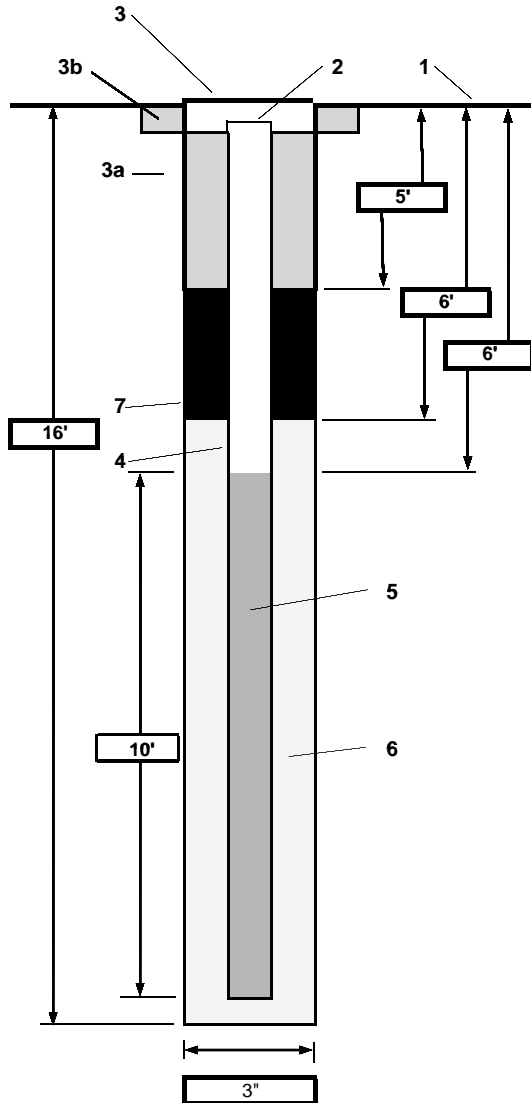
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW33</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : CJCA Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 12.35' btoc START : 7/22/2009 1650 LOGGER : Daniel Brown



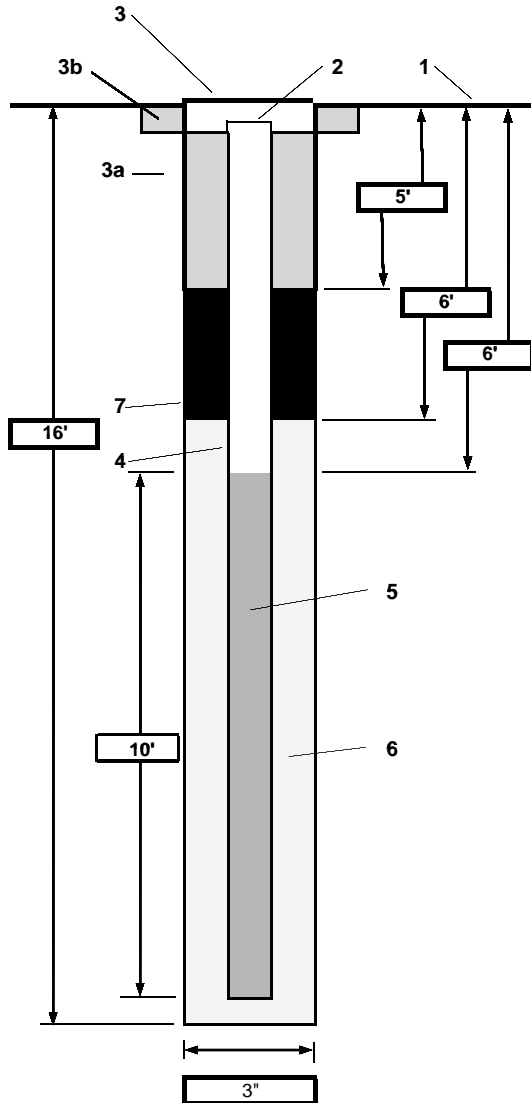
1- Ground elevation at well	14.30
2- Top of casing elevation	15.96
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW34</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 13.10' btoc	START : 7/22/2009 1515
LOGGER : Daniel Brown	



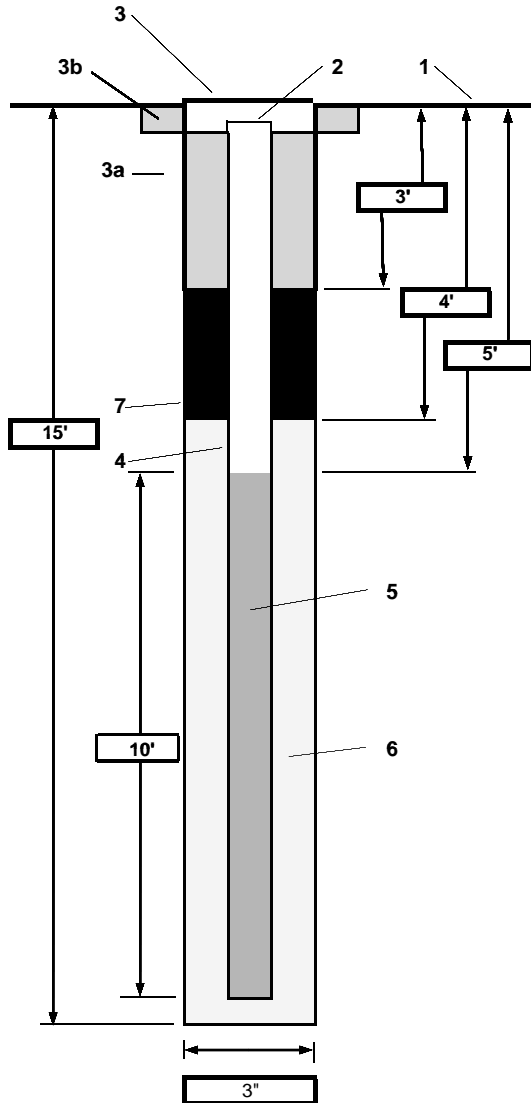
1- Ground elevation at well	12.72
2- Top of casing elevation	14.96
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	2.5 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW35</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 8.65' btoc	START : 7/21/2009 1605
LOGGER : Daniel Brown	



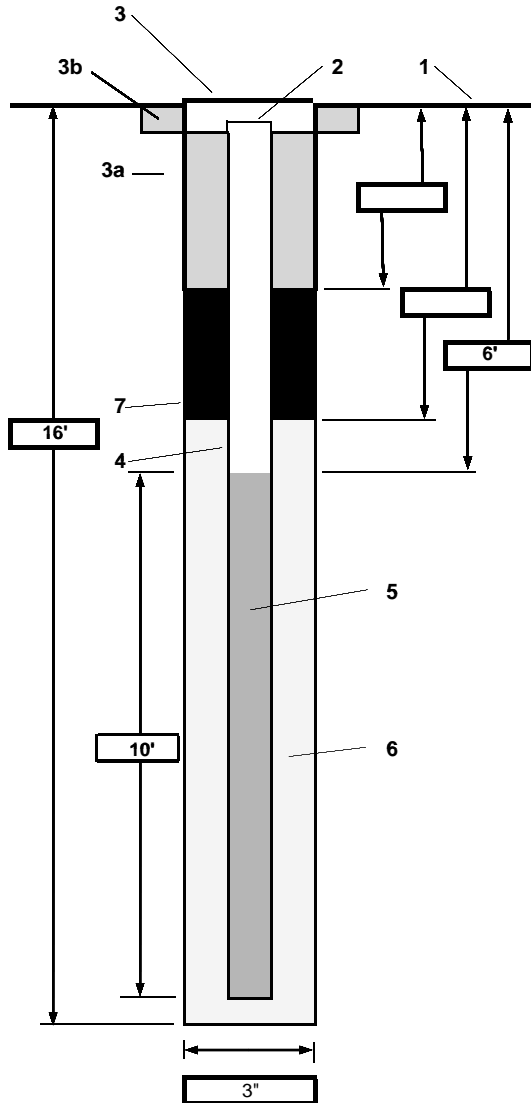
1- Ground elevation at well	7.95
2- Top of casing elevation	9.19
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	4 gals
Comments:	





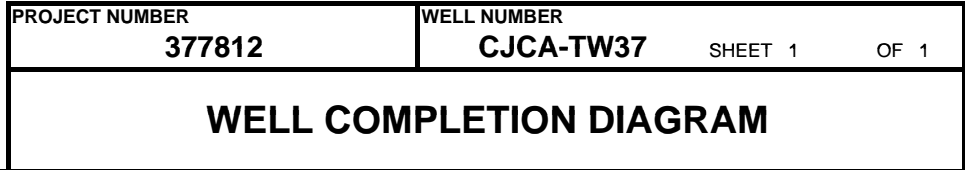
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>CJCA-TW36</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : CJCA Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 11.87 btoc	START : 7/21/2009 0930
LOGGER : Daniel Brown	



1- Ground elevation at well	15.98
2- Top of casing elevation	17.98
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT: CT0-011

LOCATION : CJCA Camp Lejeune, NC

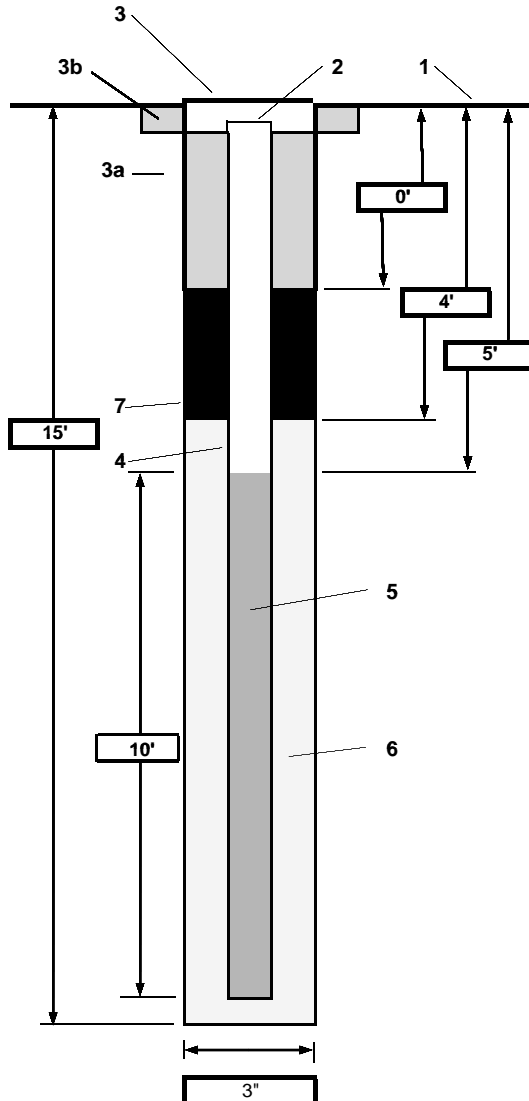
DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 13.87' btoc

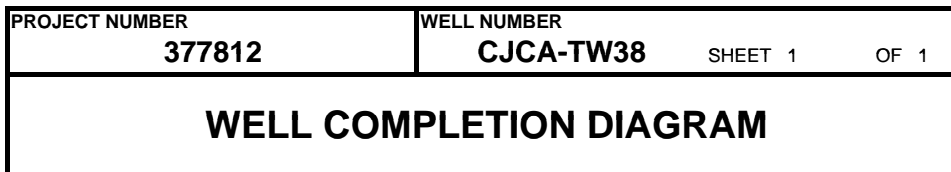
START: 7/23/2009 1010

LOGGER : S. Beville

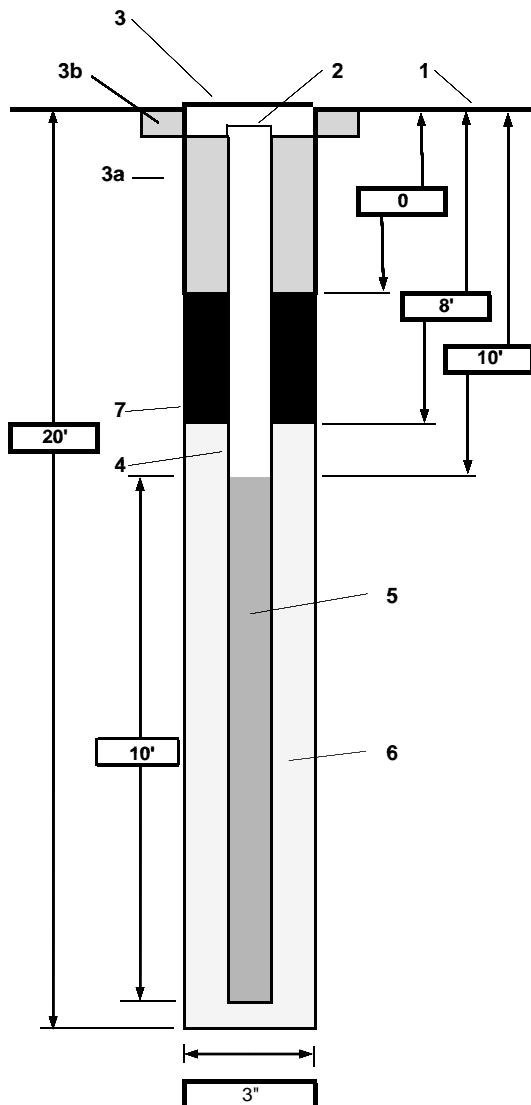


- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 1- Ground elevation at well       | 11.48                                 |
| 2- Top of casing elevation        | 13.80                                 |
| 3- Wellhead protection cover type |                                       |
| a) drain tube?                    |                                       |
| b) concrete pad dimensions        |                                       |
| 4- Dia./type of well casing       | 1" Schedule PVC 40                    |
| 5- Type/slot size of screen       | pre-packed 0.01" Slot PVC Schedule 40 |
| 6- Type screen filter             | Type 2 sand                           |
| a) Quantity used                  | 1(50 lb) bag                          |
| 7- Type of seal                   | 3/8" Bentonite Holeplug               |
| a) Quantity used                  |                                       |
| Development method                | Peristaltic pump                      |
| Development time                  | 1 hour                                |
| Estimated purge volume            | 0.25 gals                             |
| Comments:                         |                                       |





LOGGER : Daniel Brown



- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 1- Ground elevation at well       | 4.94                                  |
| 2- Top of casing elevation        | 6.70                                  |
| 3- Wellhead protection cover type |                                       |
| a) drain tube?                    |                                       |
| b) concrete pad dimensions        |                                       |
| 4- Dia./type of well casing       | 1" Schedule PVC 40                    |
| 5- Type/slot size of screen       | pre-packed 0.01" Slot PVC Schedule 40 |
| 6- Type screen filter             | Type 2 sand                           |
| a) Quantity used                  | 1(50 lb) bag                          |
| 7- Type of seal                   | 3/8" Bentonite Holeplug               |
| a) Quantity used                  |                                       |
| Development method                | Peristaltic pump                      |
| Development time                  | 1 hour                                |
| Estimated purge volume            | 6 gals                                |
| Comments:                         |                                       |





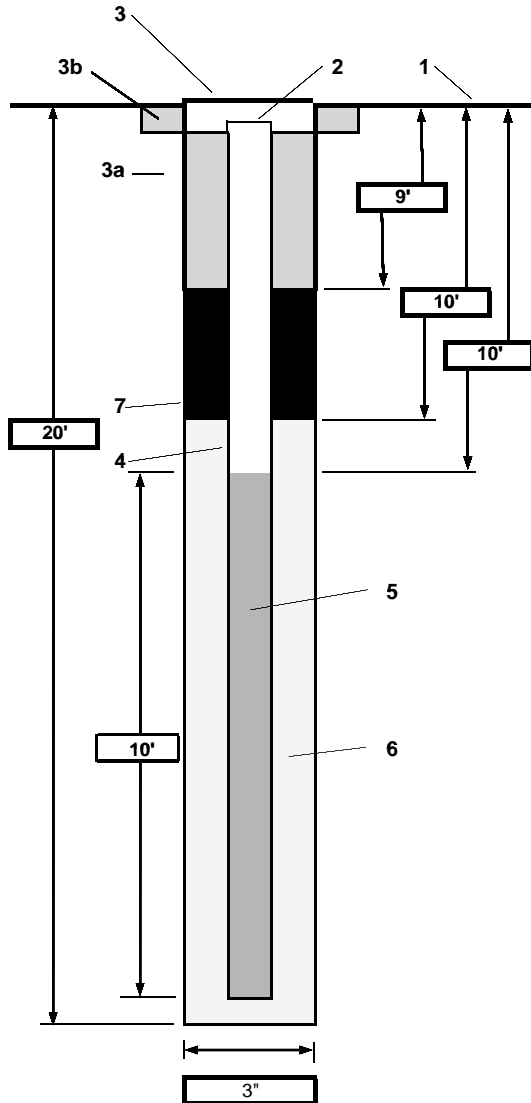
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR15-TW01</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR15 Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 12.79' btoc START : 7/26/2009 1530 LOGGER : Daniel Brown



1- Ground elevation at well 15.94

2- Top of casing elevation 16.49

3- Wellhead protection cover type  
a) drain tube?  
b) concrete pad dimensions

4- Dia./type of well casing 1" Schedule PVC 40

5- Type/slot size of screen pre-packed 0.01" Slot PVC Schedule 40

6- Type screen filter  
a) Quantity used  
Type 2 sand  
1(50 lb) bag

7- Type of seal  
a) Quantity used  
3/8" Bentonite Holeplug

Development method Peristaltic pump

Development time 1 hour

Estimated purge volume 3gals

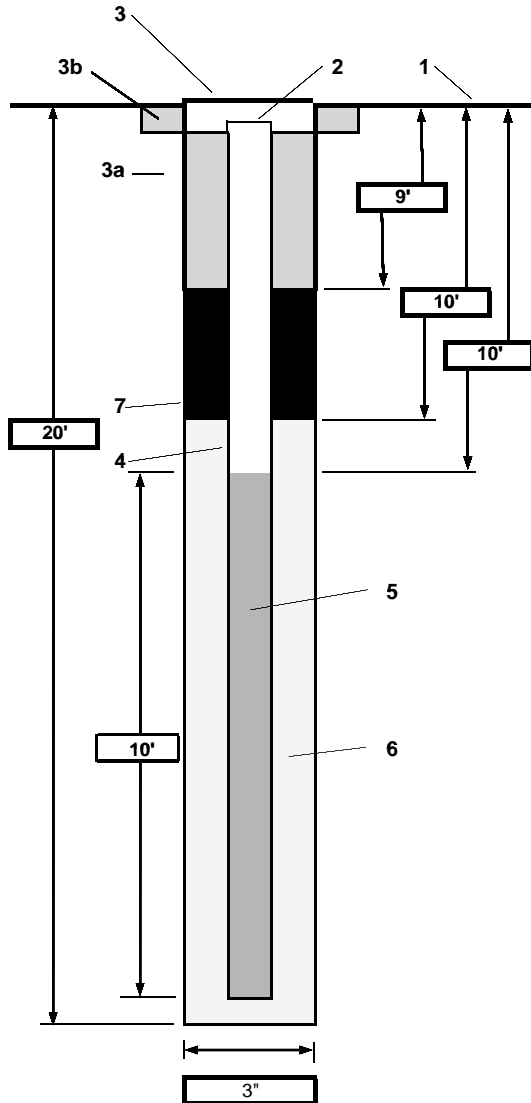
Comments:





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR15-TW02</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : IR15 Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 14.47' btoc	START : 7/26/2009 1530
LOGGER : Daniel Brown	



1- Ground elevation at well	15.02
2- Top of casing elevation	15.66
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	2 gals
Comments:	





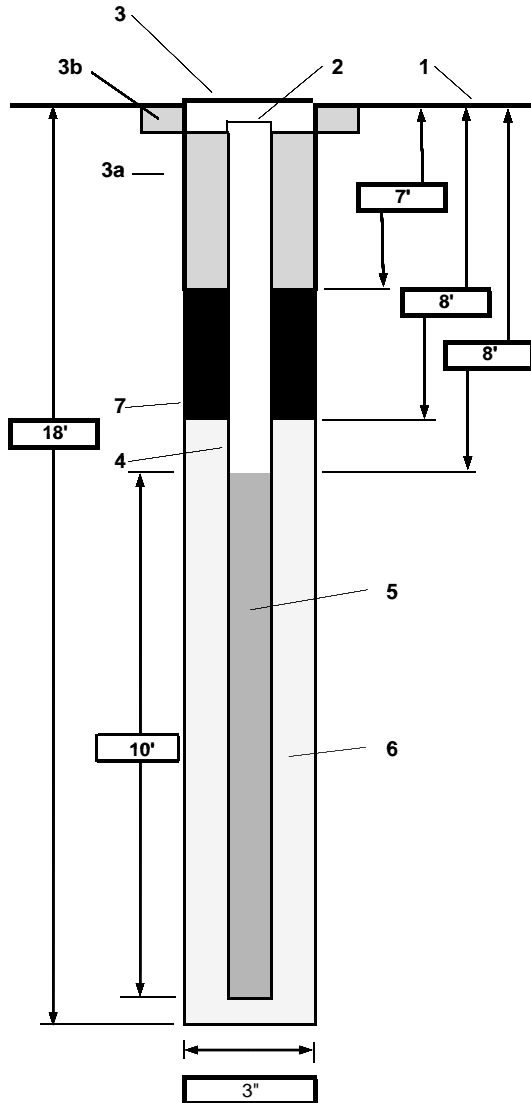
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR15-TW03</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR15 Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 15.92' btoc START : 7/27/2009 0915 LOGGER : Daniel Brown



1- Ground elevation at well	15.91
2- Top of casing elevation	17.45
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





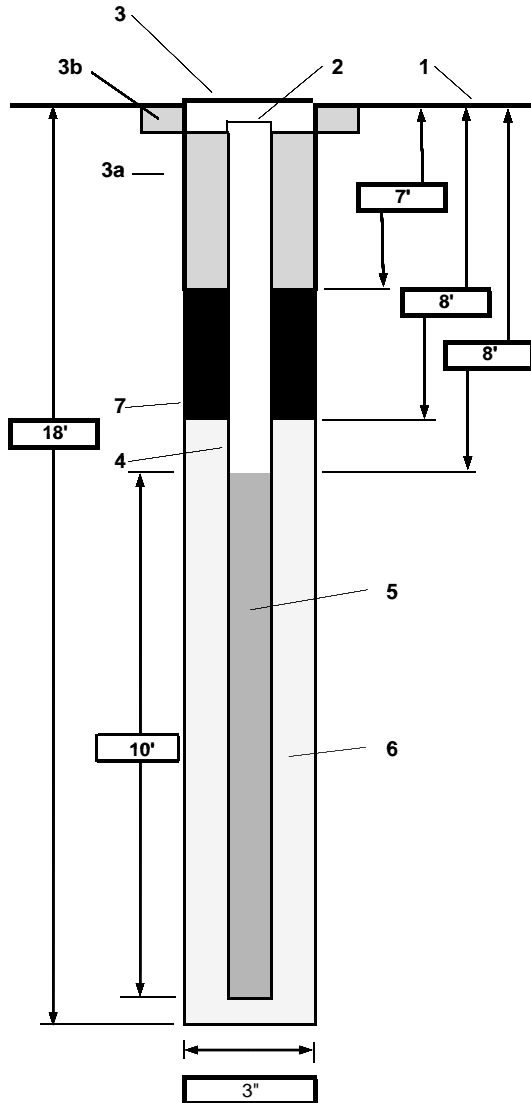
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR15-TW04</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR15 Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

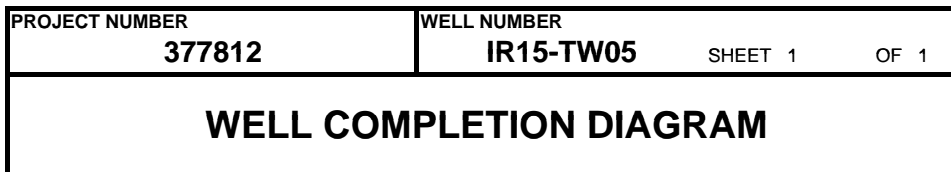
DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 11.20' btoc START : 7/27/2009 1110 LOGGER : Daniel Brown

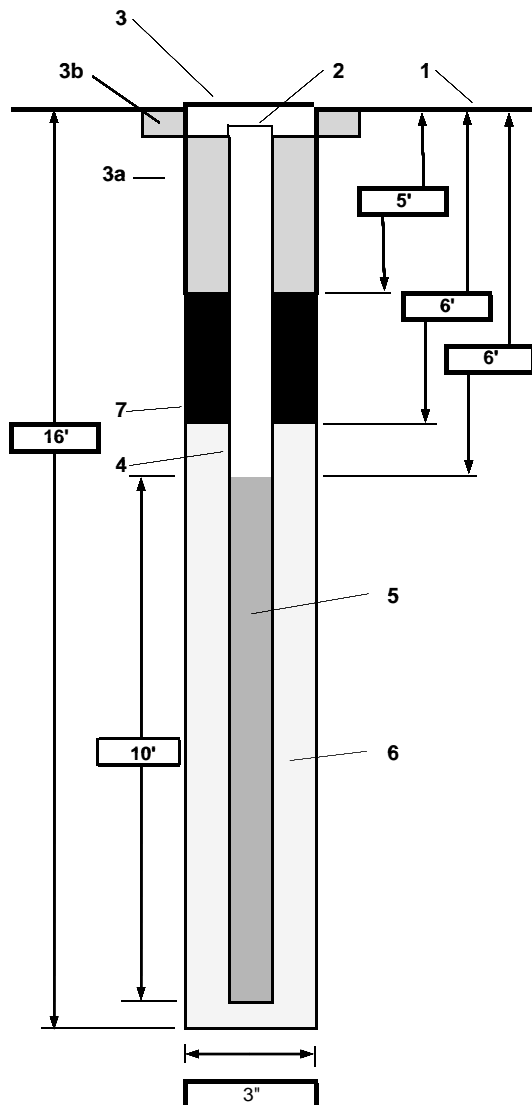


1- Ground elevation at well	15.31
2- Top of casing elevation	17.11
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A 6 gals
Comments:	





LOGGER : Daniel Brown



- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 1- Ground elevation at well       | 12.32                                 |
| 2- Top of casing elevation        | 12.91                                 |
| 3- Wellhead protection cover type |                                       |
| a) drain tube?                    |                                       |
| b) concrete pad dimensions        |                                       |
| 4- Dia./type of well casing       | 1" Schedule PVC 40                    |
| 5- Type/slot size of screen       | pre-packed 0.01" Slot PVC Schedule 40 |
| 6- Type screen filter             | Type 2 sand                           |
| a) Quantity used                  | 1(50 lb) bag                          |
| 7- Type of seal                   | 3/8" Bentonite Holeplug               |
| a) Quantity used                  |                                       |
| Development method                | Peristaltic pump                      |
| Development time                  | 1 hour                                |
| Estimated purge volume            | N/A                                   |
| Comments:                         |                                       |





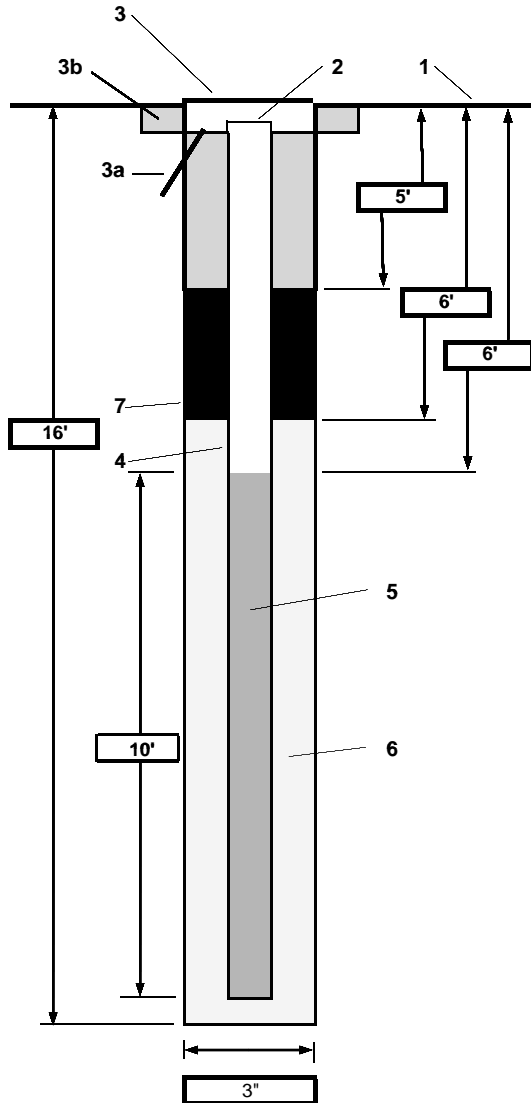
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR17-TW01</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR17 Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 10.88' btoc START : 7/28/2009 1000 LOGGER : Daniel Brown



1- Ground elevation at well	6.63
2- Top of casing elevation	7.40
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	3 gals
Comments:	





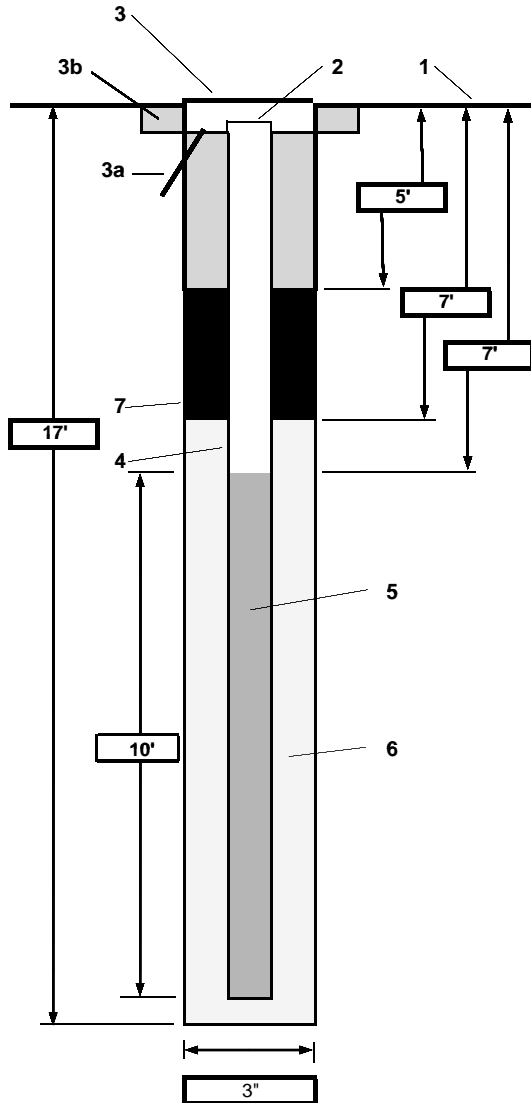
PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR17-TW02</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR17 Camp Lejeune, NC

DRILLING CONTRACTOR : SAEDACCO

DRILLING METHOD AND EQUIPMENT USED : DPT

WATER LEVELS : 10.07 btoc START : 7/28/2009 1130 LOGGER : Daniel Brown



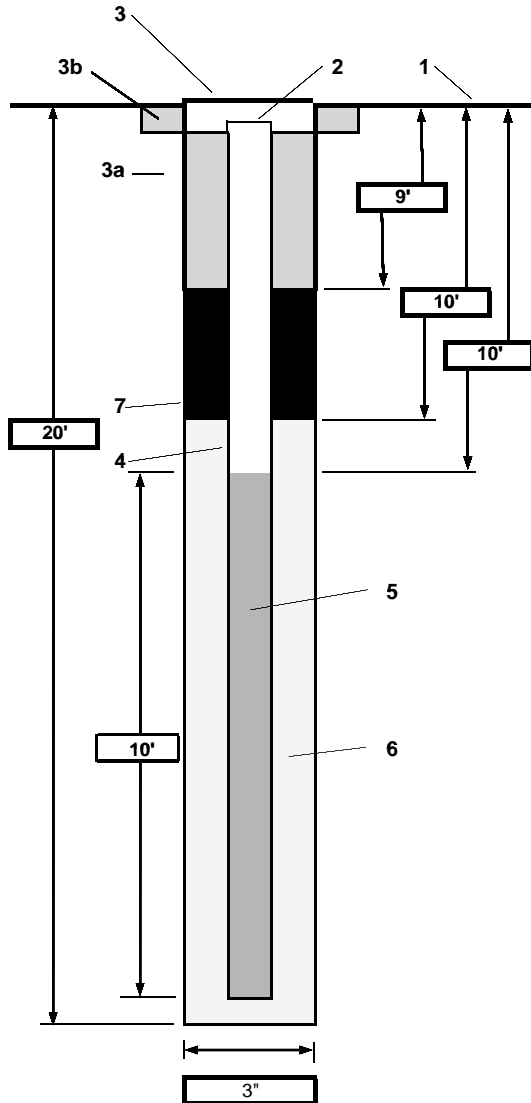
1- Ground elevation at well	8.29
2- Top of casing elevation	16.16
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR85-TW04</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : IR85 Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 14.65' btoc	START : 7/26/09 0800
LOGGER : Daniel Brown	



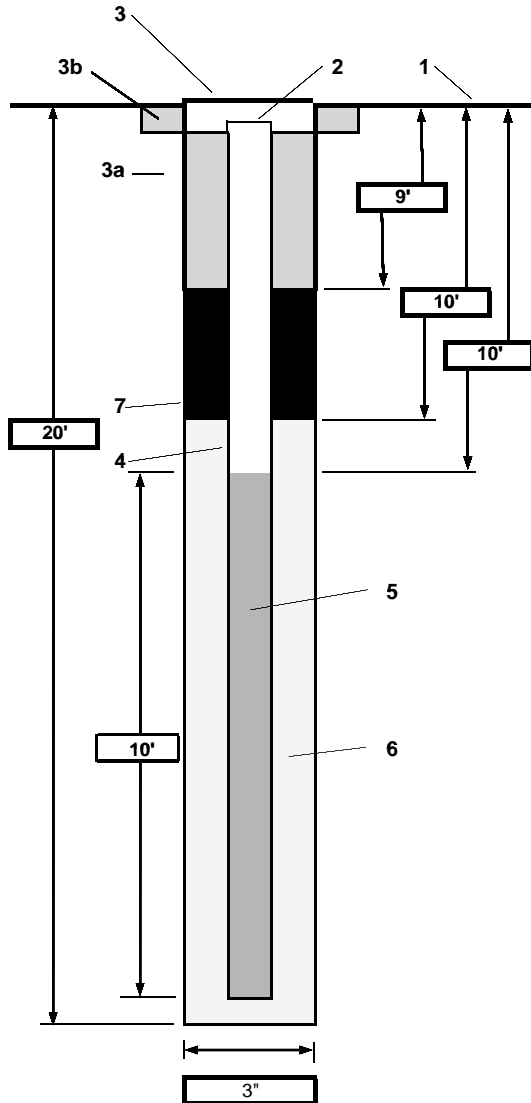
1- Ground elevation at well	17.73
2- Top of casing elevation	21.70
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	N/A
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR85-TW05</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : IR85 Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 15.67' btoc	START : 7/27/2009 1500
LOGGER : Daniel Brown	

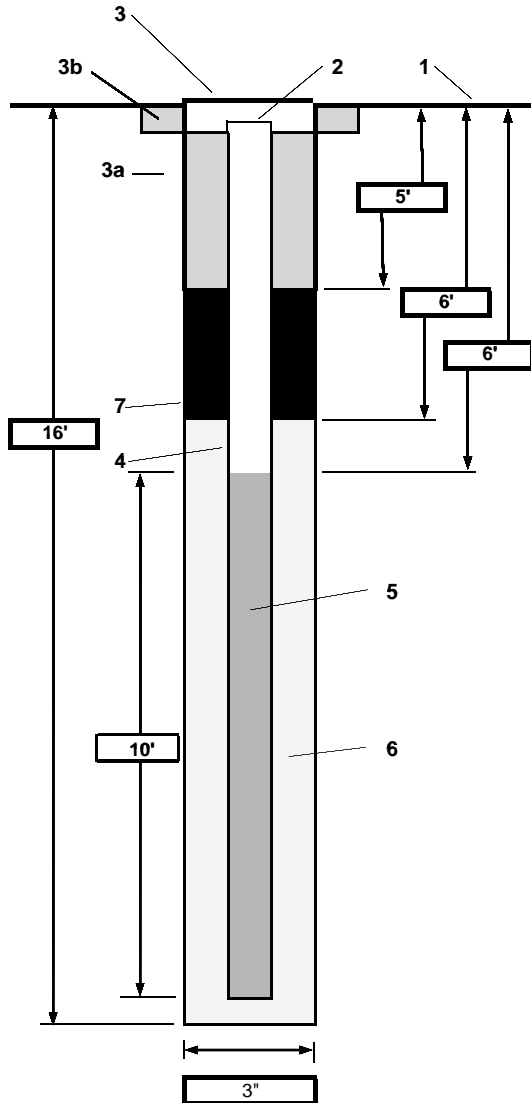






PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR85-TW06</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011	LOCATION : IR85 Camp Lejeune, NC
DRILLING CONTRACTOR : SAEDACCO	
DRILLING METHOD AND EQUIPMENT USED : DPT	
WATER LEVELS : 10.22' btoc	START : _____
LOGGER : Daniel Brown	

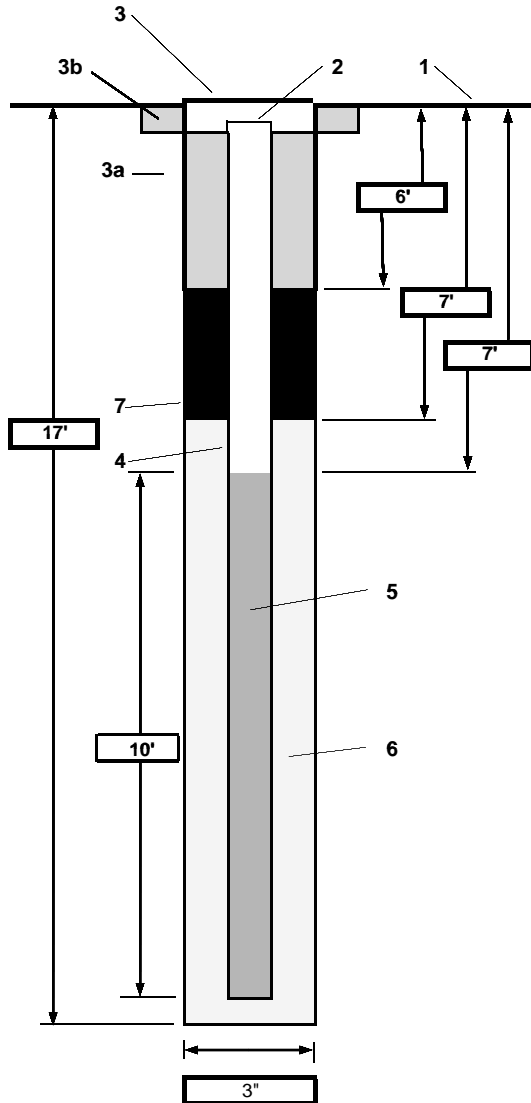






PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR85-TW07</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR85 Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 11.90' btoc START : 7/28/2007 1420 LOGGER : Daniel Brown



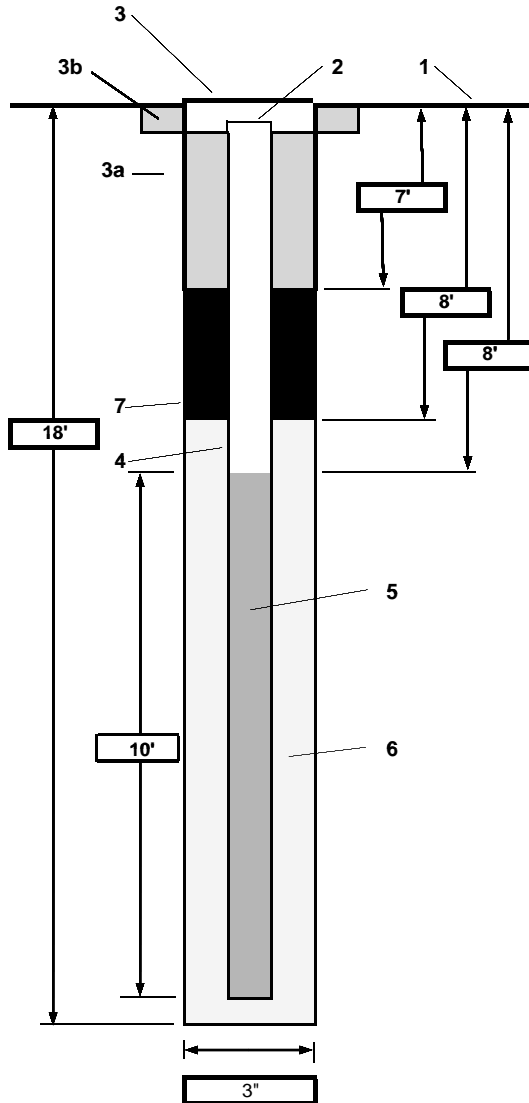
1- Ground elevation at well	14.80
2- Top of casing elevation	16.55
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1(50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	5 gals
Comments:	





PROJECT NUMBER <b>377812</b>	WELL NUMBER <b>IR85-TW08</b>	SHEET 1	OF 1
<b>WELL COMPLETION DIAGRAM</b>			

PROJECT : CT0-011 LOCATION : IR85 Camp Lejeune, NC  
 DRILLING CONTRACTOR : SAEDACCO  
 DRILLING METHOD AND EQUIPMENT USED : DPT  
 WATER LEVELS : 12.52' btoc START : 7/28/2009 1515 LOGGER : Daniel Brown



1- Ground elevation at well	16.14
2- Top of casing elevation	17.74
3- Wellhead protection cover type	
a) drain tube?	
b) concrete pad dimensions	
4- Dia./type of well casing	1" Schedule PVC 40
5- Type/slot size of screen	pre-packed 0.01" Slot PVC Schedule 40
6- Type screen filter	Type 2 sand
a) Quantity used	1 (50 lb) bag
7- Type of seal	3/8" Bentonite Holeplug
a) Quantity used	
Development method	Peristaltic pump
Development time	1 hour
Estimated purge volume	4 gals
Comments:	



## Appendix C

# Investigation-Derived Waste Manifests

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Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator ID Number <b>NCL 170 022580</b>		2. Page 1 of <b>1</b>		3. Emergency Response Phone <b>910-451-9607</b>		4. Manifest Tracking Number <b>002215417 JJK</b>			
		5. Generator's Name and Mailing Address <b>MCB Camp Lejeune PSC 20004, Attn: I&amp;E/EMD/ECB/RORS, Camp Lejeune, NC 28542</b>		Generator's Site Address (if different than mailing address) <b>MCB Camp Lejeune Parachute Tower Road Camp Lejeune NC 28542</b>							
6. Transporter 1 Company Name <b>Evo Corporation</b>		U.S. EPA ID Number <b>NCD 982 114 803</b>		7. Transporter 2 Company Name		U.S. EPA ID Number					
8. Designated Facility Name and Site Address <b>Ecoflo, Inc. 2750 Patterson Street, Greensboro, NC 27407</b>		U.S. EPA ID Number <b>NCD 980 842 132</b>		Facility's Phone: <b>336-855-7925</b>							
<b>GENERATOR</b>	9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))			10. Containers		11. Total Quantity	12. Unit WL/Vol.	13. Waste Codes		
					No.	Type					
		1. Environmentally Hazardous Waste Substance, Solid, Mercury, 9, UN 3077 <b>PB III</b>				<b>DM</b>		<b>P</b>	<b>D008</b> <b>D009</b>		
		2.									
		3.									
	4.										
14. Special Handling Instructions and Additional Information <b>ab.1 Batteries for Recycling</b> <div style="text-align: right;"><b>Evo # 080907</b></div>											
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.											
Generator's/Offeror's Printed/Typed Name					Signature			Month	Day	Year	
<b>INT'L</b>	16. International Shipments <input type="checkbox"/> Import to U.S. <input type="checkbox"/> Export from U.S. Port of entry/exit: _____ Transporter signature (for exports only): _____ Date leaving U.S.: _____										
	17. Transporter Acknowledgment of Receipt of Materials										
<b>TRANSPORTER</b>	Transporter 1 Printed/Typed Name				Signature			Month	Day	Year	
	Transporter 2 Printed/Typed Name				Signature			Month	Day	Year	
<b>DESIGNATED FACILITY</b>	18. Discrepancy										
	18a. Discrepancy Indication Space <input type="checkbox"/> Quantity <input type="checkbox"/> Type <input type="checkbox"/> Residue <input type="checkbox"/> Partial Rejection <input type="checkbox"/> Full Rejection										
	Manifest Reference Number: _____										
	18b. Alternate Facility (or Generator) U.S. EPA ID Number _____										
	Facility's Phone: _____										
	18c. Signature of Alternate Facility (or Generator)								Month	Day	Year
19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)											
	1.	2.	3.	4.							
20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a											
Printed/Typed Name					Signature			Month	Day	Year	



**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.  
**NC617400225B0**

Manifest  
Document No.

2. Page 1  
of 1

**07725**

3. Generator's Name and Mailing Address  
**MCB Camp Lejeune  
PSC Box 20004, ATTN: EEE/EMD/ECB/RCRS  
Camp Lejeune, NC 28542**

**MCB Camp Lejeune  
Parachute Tower Road  
Camp Lejeune, NC 28542**

4. Generator's Phone ( **910** ) **451-9107**, **Bob Lowder/EMD**

5. Transporter 1 Company Name  
**Evo Corporation**

6. US EPA ID Number  
**NC.D9.8.2.1.14.803**

A. Transporter's Phone  
**336-725-5844**

7. Transporter 2 Company Name  
**Evo Corporation**

8. US EPA ID Number  
**NC.D9.8.2.1.14.803**

B. Transporter's Phone  
**336-725-5844**

9. Designated Facility Name and Site Address  
**ECOFLO, INC.  
2750 Patterson Street  
Greensboro, NC 27407**

10. US EPA ID Number  
**NC.D9.8.0.842.132**

C. Facility's Phone  
**336-855-7925**

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total  
Quantity

14. Unit  
Wt/Vol

a. **Non-Hazardous, Non-Regulated Contaminated Soil**

**005** **DM**

**est. 3,700**

**P**

b. **Non-Hazardous, Non-Regulated Contaminated Water**

**008** **DM**

**est. 3,600**

**P**

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

**11a. Soil cuttings from sampling & well installation 50ADT**  
**11b. purge/deion water from groundwater sampling**

**EVO # 080907**

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

**Jon A. Myles JR**

Signature

**Jon A. Myles JR**

Month Day Year

**11-21-09**

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

**TERRY CRAIG**

Signature

**Terry Craig**

Month Day Year

**11-21-09**

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

**Corey A. Beggs**

Signature

**Corey A. Beggs**

Month Day Year

**12-15-09**



Appendix D  
Laboratory Analytical Results and Chain of  
Custody Forms

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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of

Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time										Lab Cooler No.		CLIENT COMMENTS	
Client: CH2M Hill					# of Containers													
Send Results To: Greenville Murre					Container Type													
Address: 5700 Cleveland St					Preservative Used													
Virginia Beach, VA					Type of Analysis													
Phone: 757-671-6284																		
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Pb, Sb, Cu, Zn, As (60103) <th>Dissolved Pb, Sb, Cu, Zn, As (60103) <th>Total Metals (60103/7470A) <th>Volatile Metals (60103/7470A) <th>VOC (8210A/8082) <th>SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th></th></th></th></th></th>	Dissolved Pb, Sb, Cu, Zn, As (60103) <th>Total Metals (60103/7470A) <th>Volatile Metals (60103/7470A) <th>VOC (8210A/8082) <th>SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th></th></th></th></th>	Total Metals (60103/7470A) <th>Volatile Metals (60103/7470A) <th>VOC (8210A/8082) <th>SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th></th></th></th>	Volatile Metals (60103/7470A) <th>VOC (8210A/8082) <th>SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th></th></th>	VOC (8210A/8082) <th>SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th></th>	SVC (8210B) <th>SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </th>	SVC (8210C) <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>							
CKA-TNW-04C	7/22	9:30	AQ	DS	X	X												
RES-MW04-09C	7/22	11:00	AQ	DS			X	X	X	X							Parent Sample	
RES-MW04-09C-MS	7/22	11:00	AQ	DS			X	X	X	X							MS	
RES-MW04-09C-SD	7/22	11:00	AQ	DS			X	X	X	X							MSD	
RES-TB01-042129	7/22	14:10	AQ	PS					X									
Relinquished By: PS Ashaw		Date/Time: 7/24/11 5:30	Received By:		Relinquished By:		Received for Laboratory By:		Date/Time:									
Relinquished By:		Date/Time:	Received By:		Date/Time:	Shipper:		Airbill No.:										
Relinquished By:		Date/Time:	Received By:		Lab Comments:							Temp:						

G.P. W.O. \_\_\_\_\_



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

1 of 4 Pgs.

Project: CTO II Camp Johnson					Turnaround Time									
Client: CH2M HILL					# of Containers									
Send Results To: Genevieve Moore					Container Type									
Address: 5700 Cleveland St Ste 101					Preservative Used									
Virginia Beach VA 23462					Type of Analysis									
Phone:					Lab Cooler No.									
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS									
CXA-SSC70-07C	7/6/09	1545	SO	DH										
CXA-SSC70D-07C	7/6/09	1550	SO	DA										
CXA-SSC71-07C	7/6/09	1610	SO	DH										
CXA-SSC72-07C	7/6/09	1620	SO	DH										
CXA-SSC72-07C		1620	SO	CB/mu										
CXA-SSC71-07C		1605	SO	CB/mu										
CXA-SSC82-07C		1530	SO	CB/mu										
CXA-SSC74-07C		1635	SO	CB/mu										
CXA-SSC74-07C		1510	SO	CB/mu										
CXA-SSC50-07C		1635	SO	JF/mu										
CXA-SSC48-07C		1645	SO	JF/mu										
CXA-SSC61-07C		1700	SO	JF/mu										
Relinquished By:		Date/Time		Received By:			Relinquished By:			Received for Laboratory By:			Date/Time	
[Signature]		7/7/09 943												
Relinquished By:		Date/Time		Received By:			Date/Time		Shipper:		Airbill No.:			
Relinquished By:		Date/Time		Received By:			Lab Comments:					Temp:		

G.P. W.O. \_\_\_\_\_



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

2 of 4

Pgs.

Project: CTC II Camp Johnson					Turnaround Time									
Client: CH2M Hill					# of Containers									
Send Results To: Genevieve Moore					Container Type									
Address: 5700 Cleveland St Ste 101					Preservative Used									
Virginia Beach VA 23462					Type of Analysis									
Phone: 757-671-6284					Lab Cooler No.									
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS									
CXA-SS114-09C	7/18/09	1700	SO	DH										
CXA-SS111-09C		1720	SO	DH										
CXA-SS114-09C	SD	1700	SO	DH	MSD									
CXA-SS114-09C	ms	1700	SO	DH	MS									
CXA-SS110-09C		1650	SO	DH										
CXA-SS113-09C		1710	SO	DH										
CXA-SS175D-09C		1715	SO	CB/mw	DUPLICATE									
CXA-SS178-09C		1725	SO	CB/mw										
CXA-SS177-09C		1735	SO	CB/mw										
CXA-SS175-09C		1710	SO	CB/mw										
CXA-SS045-09C	7/19/09	0730	SO	JF/ms	Bottle shows SS44, should be 045									
CXA-SS045-09C	SD	0730	SO	JF/ms	MSD → should be 045									
Relinquished By: Genevieve Moore		Date/Time: 7/19/09 1445		Received By:			Relinquished By:			Received for Laboratory By:			Date/Time:	
Relinquished By:		Date/Time:		Received By:			Date/Time:		Shipper:		Airbill No.:			
Relinquished By:		Date/Time:		Received By:			Lab Comments:					Temp:		

G.P. W.O. \_\_\_\_\_



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

377812.F1-F5

3 of 4 Pgs.

Project: C7C-11 Camp Johnson					Turnaround Time											
Client: CH2M HILL					# of Containers											
Send Results To: Genevieve Matic					Container Type											
Address: 5700 Cleveland St Ste 101					Preservative Used											
Virginia Beach, VA 23462					Type of Analysis											
Phone: 757 671-6284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
CXA-SS045-09C	7/9/09	0730	SO	JF/MS	X											MS - Bottle shows SS 047, should be SS 045  all collected on the 9th, bottleware shows 8th, not correct
CXA-SS112-09C	7/9/09	0735	SO	DH	X											
CXA-SS106-09C	7/9/09	0755	SO	DH	X	X										
CXA-SS109-09C	7/9/09	0745	SO	DH	X											
CXA-SS007-09C		0750	SO	JF/MS	X											
CXA-SS064-09C		0800	SO	JF/MS	X											
CXA-SS066-09C		0820	SO	DH	X											
CXA-SS138-09C		0825	SO	DH	X											
CXA-SS107-09C		0830	SO	DH	X											
CXA-SS108-09C		0840	SO	DH	X											
CXA-SS160-09C		0830	SO	JF/MS	X	X										
CXA-SS066-09C		0840	SO	JF/MS	X	X										
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time					
[Signature]		7/9/09 4/5														
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:								
Relinquished By:		Date/Time	Received By:		Lab Comments:						Temp:					

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**GPL LABORATORIES, LLC**

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
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Contract #/Billing Reference

4 of 11 Pgs.

[illegible]

**G.P. W.O.**



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

377812.FITS

1 of 3

Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time												
Client: CHIDM Hill					# of Containers												
Send Results To: Genevieve Moore					Container Type												
Address: 5700 Cleveland St Ste 101					Preservative Used												
Virginia Beach VA 23462					Type of Analysis												
Phone: 757 671-6284					Lab Cooler No.												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS		
CXA-SS084-09C	7/16/09	0835	SO	CB/mw	X												
CXA-SS085-09C		0820	SO	CB/mw	X												
CXA-SS086-09C		0755	SO	CB/mw	X												
CXA-SS087-09C		0800	SO	CB/mw	X												duplicate
CXA-SS088-09C		0900	SO	CB/mw	X												
CXA-SS089-09C		0915	SO	CB/mw	X												
CXA-SS090-09C		0920	SO	CB/mw	X												
CXA-SS091-09C		0810	SO	CB/mw	X												
CXA-SS092-09C-SD		0810	SO	CB/mw	X												MSD
CXA-SS093-09C-MS		0810	SO	CB/mw	X												MS
CXA-SS094-09C		0905	SO	CB/mw	X												
CXA-SS095-09C		0905	SO	CB/mw	X												
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time						
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:									
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:							

G.P. W.O. \_\_\_\_\_



# GPL LABORATORIES, LLLP

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

377812-FILES

2 of 3

Pgs.

Project: 070-11 CKA					Turnaround Time														
Client: CHAD HILL					# of Containers														
Send Results To: [illegible]					Container Type														
Address: 5700 Chickadee St SE					Preservative Used														
Vermont Beach VA 22462					Type of Analysis														
Phone: 757-691-6214					Lab Cooler No.														
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials														CLIENT COMMENTS	
070A-SS062-090	7/10/1	9:25	SC	MS	X														
070A-SS074-090		0940	SC	DH	X	X													
070A-SS076-090		0910		DH	X														
070A-SS078-090		0930		DH	X														
070A-SS079-090		0920		DH	X														
070A-SS105-090		0955		MS	X														
070A-SS105D-090		0955		MS	X														
070A-SS100-090		1015		MS	X	X													
070A-SS103-090		1005		MS	X	X													
070A-SS153-090		1015		MS	X														
070A-SS147-090		1025		MS	X														
070A-SS150-090		0955		MS	X														
Relinquished By:		Date/Time	Received By:		Relinquished By:				Received for Laboratory By:				Date/Time						
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:											
Relinquished By:		Date/Time	Received By:		Lab Comments:						Temp:								

G.P. W.O. \_\_\_\_\_



**EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD**  
**SHIP TO: 227 French Landing Drive, Suite 550 • Nashville, TN 37228 • 615-345-1115 • (fax) 615-846-5426**

43689

Send Results to:		Send Invoice to:		Analysis Requirements:												Lab Use Only:																																																																																																							
Name <u>Genevieve Hill</u>		Name <u>Genevieve Hill</u>		<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 5px;">             Analysis Requirements: (check)           </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> </div>																																																																																																																VOA Headspace      Y      N      NA Field Filtered      Y      N      NA Correct Containers      Y      N      NA Discrepancies      Y      N      NA Cust. Seals Intact      Y      N      NA Containers Intact      Y      N      NA  Airbill #: _____ CAR #: _____			
Company <u>CH2M Hill</u>		Company _____																																																																																																																					
Address <u>5700 Cleveland St SE</u>		Address _____																																																																																																																					
City <u>Virginia Beach VA 23462</u>		City _____																																																																																																																					
State, Zip <u>VA 23462</u>		State, Zip _____																																																																																																																					
Phone <u>757 676 6289</u>		Phone _____																																																																																																																					
Fax _____		Fax _____																																																																																																																					
E-mail _____		E-mail _____																																																																																																																					
Project No./Name:		Sampler's (Signature):																																																																																																																					
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix																	Comments	No. of Bottles	Lab Use Only Containers/Pres.																																																																																																	
	7/19/09 0955	CJCA-SS150-09C-MS	SD	X															MS																																																																																																				
	7/19/09 1035	CJCA-SS150-09C		X															MSD																																																																																																				
	7/19/09 1035	CJCA-SS150-09C		X																																																																																																																			
	7/19/09 1100	CJCA-SS101-09C		X																																																																																																																			
	7/19/09 1105	CJCA-SS102-09C		X																																																																																																																			
	7/19/09 1105	CJCA-SS104-09C		X																																																																																																																			
	7/19/09 1040	CJCA-SS145-09C		X																																																																																																																			
	7/19/09 1050	CJCA-SS143-09C		X																																																																																																																			
	7/19/09 1120	CJCA-SS139-09C		X																																																																																																																			
	7/19/09 1030	CJCA-SS146-09C		X																																																																																																																			
	7/19/09 1135	CJCA-SS140-09C		X																																																																																																																			
	7/19/09 1140	CJCA-SS140D-09C		X															duplicate																																																																																																				
Sample Kit Prep'd by: (Signature)		Date/Time	Received By: (Signature)		REMARKS:																Details:  Page _____ of _____  Cooler No. _____ of _____  Date Shipped _____  Shipped By _____  Turnaround _____																																																																																																		
Relinquished by: (Signature)		Date/Time	Received By: (Signature)																																																																																																																				
Relinquished by: (Signature)		Date/Time	Received By: (Signature)																																																																																																																				
Received for Laboratory by: (Signature)		Date/Time	Temperature																																																																																																																				

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.



GPL

1 of 2 43687

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.



**EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD**  
 SHIP TO: 227 French Landing Drive, Suite 550 • Nashville, TN 37228 • 615-345-1115 • (fax) 615-846-5426

Send Results to:		Send Invoice to:		Analysis Requirements:												Lab Use Only:		
Name <u>Empire Nucor</u>		Name _____		<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">                         pH SVOC TAL Metals Lead Cadmium Copper Nickel Zinc Manganese Chromium Selenium Molybdenum Vanadium Cobalt Manganese Chromium Selenium Molybdenum Vanadium Cobalt                     </div> <div>                         [Grid for Analysis Requirements]                     </div> </div>												VOA Headspace      Y      N      NA		
Company <u>Charm Holdings</u>		Company _____														Field Filtered      Y      N      NA		
Address <u>5700 Cleveland St SE</u>		Address _____														Correct Containers      Y      N      NA		
City <u>Virginia Beach VA</u>		City _____														Discrepancies      Y      N      NA		
State, Zip <u>VA 23462</u>		State, Zip _____														Cust. Seals Intact      Y      N      NA		
Phone <u>757-671-6284</u>		Phone _____		Containers Intact      Y      N      NA			Airbill #: _____											
Fax _____		Fax _____					CAR #: _____											
E-mail _____		E-mail _____																
Project No./Name:		Sampler's (Signature):																

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix													Comments	No. of Bottles	Lab Use Only Containers/Pres.
	7/10/13	CJCA-SS140-09C	SD	X												duplicate		
	7/15/13	CJCA-SS166-09C	ISO	X														
	7/15/13	CJCA-SS167-09C	ISO	X														
	7/15/13	CJCA-SS167D-09C	SD	X												duplicate		
	7/15/13	IRIS-EP270-09C	Blank		X	X										Equip Blank		
	7/14/13	CJCA-EB170719	Blank	X												Equip Blank		
	7/15/13	CJCA-SS151-09C	ISO	X														
	7/15/13	CJCA-SS173-09C		X														
	7/15/13	CJCA-SS149-09C		X														
	7/15/13	CJCA-SS140-09C		X														
	7/15/13	CJCA-SS148-09C		X														
	7/17/13	CJCA-SS148D-09C		X														

Sample Kit Prep'd by: (Signature)		Date/Time	Received By: (Signature)	REMARKS:	Details:	
Relinquished by: (Signature)		Date/Time	Received By: (Signature)			
Relinquished by: (Signature)		Date/Time	Received By: (Signature)			
Received for Laboratory by: (Signature)		Date/Time	Temperature			

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.



30f3 5871

GPL

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

377-12115

1 of 1 Pgs.

Project: CTA-11 CAMPUS HOSCH					Turnaround Time														
Client: CH2M HILL					# of Containers														
Send Results To: GEORGE V. AMIC					Container Type														
Address: 5700 CHICKADEE DR. 70111					Preservative Used														
VIRGINIA BEACH, VA 23462					Type of Analysis														
Phone: 757-611-1284					Lab Cooler No.														
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS														
CICA-55203-09	7/7/09	08:00	SO	UH	X														
CICA-55214-09	7/7/09	08:00	SO	UH	X														
CICA-55230-09	7/7/09	08:00	SO	UH	X														
CICA-55299-09	7/7/09	08:15	SO	UH	X														
CICA-55210709	7/7/09	08:45	W	CM	X														
CICA-55210-09	7/7/09	08:35	SO	DH	X	X													
CICA-55211-09	7/7/09	08:50	SO	UH	X														
CICA-55210-09	7/7/09	09:10	SO	UH	X														
CICA-55211-09	7/7/09	09:45	SO	UH	X	X													
CICA-55210-09	7/7/09	09:20	SO	FB	X														
CICA-55210-09	7/7/09	08:55	SO	UH	X														
CICA-55210-09	7/7/09	08:25	SO	UH	X														
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time								
Op 11/1/09		7/7/09 4:00																	
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:											
Relinquished By:		Date/Time	Received By:		Lab Comments:			Temp:											

G.P. W.O. \_\_\_\_\_



# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

377812.FJ.FS

2

of

3

Pgs.

Project: CTD-11 CAMP JOHNSON					Turnaround Time											
Client: CH2MHILL					# of Containers											
Send Results To: GENEVIEVE ALVARO					Container Type											
Address: 5700 CLEVELAND ST STE 101					Preservative Used											
VIRGINIA BEACH, VA 23462					Type of Analysis											
Phone: (757) 671-6294					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
CXA-SS204-01C	7/7/09	09:15	SO	DH	X											
CXA-SS207-01C	7/7/09	09:35	SO	JH	X											
CXA-SS211-01C	7/7/09	09:30	SO	JH	X	X										
CXA-SS200-01C	7/7/09	09:45	SO	JH	X	X										
CXA-SS204-01C	7/7/09	10:10	SO	DH	X											
CXA-SS205-01C	7/7/09	10:00	SO	DH	X											
CXA-SS205-01C	7/7/09	10:00	SO	DH	X											
CXA-SS205-01C	7/7/09	10:10	SO	DH	X											
CXA-SS204-01C	7/7/09	10:15	SO	DH	X											
CXA-SS204-01C	7/7/09	10:15	SO	DH	X											
CXA-SS203-01C	7/7/09	10:30	SO	DH	X											
CXA-SS204-01C	7/7/09	10:50	SO	DH	X											
Relinquished By:		Date/Time		Received By:		Relinquished By:		Received for Laboratory By:		Date/Time						
[Signature]		7/7/09 4:00														
Relinquished By:		Date/Time		Received By:		Date/Time		Shipper:		Airbill No.:						
Relinquished By:		Date/Time		Received By:		Lab Comments:							Temp:			

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**GPL LABORATORIES, LLC**

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
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Contract #/Billing Reference

03774 12-FLFS

3 of 3 Pgs.

[illegible]

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Contract #/Billing Reference

5377-12 FLFS

1 of 3 Pgs.

Project: CTD 11 CAMP WAGON					Turnaround Time									
Client: CH2M HILL					# of Containers									
Send Results To: GIMVIVE MILLER					Container Type									
Address: 5700 CLEVELAND ST STE 101					Preservative Used									
VIRGINIA BEACH VA 23462					Type of Analysis									
Phone: 757-671-6284					Lab Cooler No.									
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS									
• CKA-SS201-09C	7/7/09	11:05	SO	JH										
• CKA-SS220-09C	7/7/09	10:50	SO	JH	ID=SS202									
• CKA-SS094-09C	7/7/09	10:10	SO	LB/TNW										
• CKA-SS096-09C	7/7/09	11:20	SO	LB/TNW										
• CKA-SS095-09C	7/7/09	10:55	SO	LB/TNW										
• CKA-SS008-09C	7/7/09	11:35	SO	JF/MS										
• CKA-SS009-09C	7/7/09	11:20	SO	JF/MS										
• CKA-SS206-09C	7/7/09	11:50	SO	DH										
• CKA-SS209-09C	7/7/09	11:25	SO	JH										
• CKA-SS2004-09C	7/7/09	1200	SO	JF/MS										
• CKA-SS2007-09C	7/7/09	1230	SO	JF/MS										
• CKA-SS200-09C	7/7/09	1240	SO	DH										
Relinquished By:		Date/Time	Received By:		Relinquished By:		Received for Laboratory By:		Date/Time					
[Signature]		7/7/09 11:40												
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:						
Relinquished By:		Date/Time	Received By:		Lab Comments:				Temp:					

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Contract #/Billing Reference

3778121115

2

of

Pgs.

Project: CTR-11 Pump Station					Turnaround Time									
Client: CHM Hill					# of Containers									
Send Results To: Executive Office					Container Type									
Address: 5700 Cleveland St. Ste 101					Preservative Used									
Virginia Beach VA 23462					Type of Analysis									
Phone: 757-671-6244					Lab Cooler No.									
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS									
• CICA-SS203-07	7/7/09	12:25	SO	DH										
• CICA-SS203-07	7/7/09	12:30	SO	JH										
• CICA-SS203-07	7/7/09	13:50	SO	LB/may										
• CICA-SS091-07	7/7/09	13:00	SO	FB/may										
• CICA-SS006-07	7/7/09	13:15	SO	JF/mis										
• CICA-SS001-07	7/7/09	13:00	SO	JF/mis										
• CICA-SS003-07	7/7/09	13:45	SO	JF/mis										
• CICA-SS005-07	7/7/09	14:15	SO	JF/mis										
• CICA-SS010-07	7/7/09	14:45	SO	JF/mis										
• CICA-SS002-07	7/7/09	14:30	SO	JF/mis										
• CICA-SS008-07	7/7/09	15:15	SO	UC/mis										
• CICA-SS011-07	7/7/09	15:35	SO	DH										
Relinquished By:		Date/Time	Received By:		Relinquished By:		Received for Laboratory By:		Date/Time					
[Signature]		7/7/09 4:00												
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:						
Relinquished By:		Date/Time	Received By:		Lab Comments:				Temp:					

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3 of 3 Pgs.

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Contract #/Billing Reference

1 of 3 Pgs.

Project: CTD-II Camp Johnson					Turnaround Time											
Client: CH2M HILL					# of Containers 1 1											
Send Results To: GENEVIEVE MOORE					Container Type 8oz jar 8oz jar											
Address: 5700 CLEVELAND ST STE 101					Preservative Used NONE NONE											
VIRGINIA BEACH VA 23412					Type of Analysis Lead, Antimony, Copper, Zinc, Arsenic, PH											
Phone: 757-671-6284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
• CJA-SS056-01C	7/7/09	1600	SO	DH/JH	X											
• CJA-SS058-01C	7/7/09	1610	SO	DH/JH	X	X										
• CJA-SS056D-01C	7/7/09	1555	SO	DH/JH	X											
• CJA-SS015-01C	7/7/09	1600	SO	JF+MS	X	X										
• CJA-SS017-01C	7/7/09	1615	SO	JF+MS	X	X										
• CJA-SS090-01C	7/7/09	1420	SO	MW+EB	X											MS/MSD
• CJA-SS090-01C-MS	7/7/09	1420	SO	MW+EB	X											MS/MSD
• CJA-SS090-01C-SD	7/7/09	1420	SO	MW+EB	X											MS/MSD
• CJA-SS092-01C	7/7/09	1430	SO	MW+EB	X	X										
• CJA-SS092D-01C	7/7/09	1435	SO	MW+EB	X	X										
• CJA-SS085-01C	7/7/09	1625	SO	MW+EB	X											
• CJA-SS087-01C	7/7/09	1530	SO	MW+EB	X											
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time					
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:								
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:						

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Contract #/Billing Reference

2 of 3 Pgs.

Project: CTD-11 Camp Johnson					Turnaround Time											
Client: CH2M HILL					# of Containers 1 1											
Send Results To: Genevieve Moore					Container Type 32 yr 32 yr											
Address: 5700 Cleveland St Ste 101					Preservative Used None none											
Virginia Beach, VA 23462					Type of Analysis											
Phone: 757-671-6284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
• CXA-SS089-09C	7/1/09	1520	SO	MW9EB	X											
• CXA-SS080-09C	7/1/09	1700	SO	JH	X											
• CXA-SS089-09C	7/7/09	11:45	SO	JH	X											
• CXA-SS022-09C	7/7/09	11:30	SO	IF/MS	X											
• CXA-SS081-09C	7/7/09	17:00	SO	IF/MS	X											
• CXA-SS086-09C	7/7/09	17:40	SO	FB	X	X										
• CXA-SS083-09C	7/7/09	17:25	SO	IF/MS	X											
• CXA-SS025-09C	7/7/09	17:35	SO	IF/MS	X											
• CXA-SS088-09C	7/7/09	15:55	SO	AW/LB	X											
• CXA-SS026-09C	7/8/09	07:45	SO	IF/MS	X											
• CXA-SS024-09C	7/8/09	07:30	SO	IF/MS	X	X										
• CXA-SS081-09C	7/8/09	07:50	SO	DH	X											
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time					
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:								
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:						

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Contract #/Billing Reference

377817-FLFS

3 of 3 Pgs.

Project: CTD 11 CAMP XHISEN					Turnaround Time														
Client: CTD 11 HILL					# of Containers														
Send Results To: FERRIS MCLEOD					Container Type														
Address: 5700 Chantrelle St SE					Preservative Used														
Virginia Beach VA 23462					Type of Analysis														
Phone: (571) 611-6784					Lab Cooler No.														
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS				
• CICA-SS180-09C	7/8/09	07:35	SO	DH	X														
• CICA-SS027-09C	7/8/09	08:10	SO	JF/MS	X														
• CICA-SS034-09C	7/8/09	08:15	SO	JF/MS	X														
• CICA-SS181-09C	7/8/09	08:25	SO	DH	X														
• CICA-SS182-09C	7/8/09	08:15	SO	DH	X														
• CICA-SS035-09C	7/8/09	08:45	SO	JF/MS	X														
• CICA-SS036-09C	7/8/09	08:35	SO	JF/MS	X														
• CICA-SS179-09C	7/8/09	08:50	SO	DH	X														
• CICA-SS182-09C	7/8/09	09:05	SO	DH	X														
• CICA-SS133-09C	7/8/09	07:45	SO	EB/mw	X														
• CICA-SS110-09C	7/8/09	08:50	SO	EB/mw	X														
• CICA-SS131-09C	7/8/09	08:10	SO	EB/mw	X														
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time								
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:											
Relinquished By:		Date/Time	Received By:		Lab Comments:							Temp:							

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Contract #/Billing Reference

377912 FLS

of

Pgs.

Project: CTU-11 Camp Johnson					Turnaround Time											
Client: CH2M HILL					# of Containers											
Send Results To: Genevieve Moore					Container Type											
Address: 5700 Cleveland St Ste 101					Preservative Used											
Virginia Beach, VA 23462					Type of Analysis											
Phone: 757-671-6284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
• CICA-SS121-09C	7/8/09	0915	SO	FB/mw	X											
• CICA-SS154-09C	7/8/09	0845	SO	FB/mw	X											
• CICA-SS129-09C	7/8/09	0820	SO	FB/mw	X											
• CICA-SS128-09C	7/8/09	0710	SO	FB/mw	X											
• CICA-SS033-09C	7/8/09	0930	SO	FB/mw	X											
• CICA-SS032-09C	7/8/09	0915	SO	JF&MS	X	X										
• CICA-SS167-09C	7/8/09	0735	CC	DH	X											
• CICA-SS168-09C	7/8/09	0950	SO	DH	X											
• CICA-SS141-09C	7/8/09	1020	SO	DH	X											
• CICA-SS141-09C	7/8/09	1035	SO	DH	X	X										
• CICA-SS038-09C	7/8/09	1010	SO	JF&MS	X	X										
• CICA-SS039-09C	7/8/09	1030	SO	JF&MS	X	X										
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time					
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:								
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:						

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Contract #/Billing Reference

317812 FIFS

2

of

Pgs.

Project: CTE-H CAMP JOHNSON					Turnaround Time											
Client: CH2M HILL					# of Containers											
Send Results To: Genevieve Moore					Container Type											
Address: 5700 Cleveland St Ste 101					Preservative Used											
Virginia Beach VA 23412					Type of Analysis											
Phone: 757 (470) 1284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
• CICA-SS186-09C	7/18/09	1110	SO	DH	X											
• CICA-SS186D-09C	7/18/09	1115	SO	DH	X											
• CICA-SS187-09C	7/18/09	1120	SO	DH	X											
• CICA-SS187-09C-SD		1120	SO	DH	X											MSD
• CICA-SS187-09C-MS		1120	SO	DH	X											MS
• CICA-SS124-09C		1050	SO	EB/MW	X											
• CICA-SS124-09C		1105	SO	EB/MW	X											
• CICA-SS130-09C		0950	SO	EB/MW	X											
• CICA-SS130D-09C		0955	SO	EB/MW	X											DUPLICATE
• CICA-SS134-09C		1020	SO	EB/MW	X											
• CICA-SS134-09C-SD		1020	SO	EB/MW	X											MSD
• CICA-SS134-09C-MS		1020	SO	EB/MW	X											
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time					
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:								
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:						

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377812 FLFS

3 of 3 Pgs.

Project: CTO-11 CAMP JOHNSON					Turnaround Time															
Client: CH2M HILL					# of Containers															
Send Results To: Genevieve Moore					Container Type 802/802jnk															
Address: 5700 Cleveland St Ste 101					Preservative Used none none															
Virginia Beach VA 23523462					Type of Analysis															
Phone: 757-671-6284					Lab Cooler No.															
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS					
• CICA-SS125-09C	7/8/09	1130	SO	EB/mw	X															
• CICA-SS126-09C		1140	SO	EB/mw	X															
• CICA-SS132-09C		1025	SO	EB/mw	X															
• CICA-SS041-09C		1145	SO	JF+MS	X															
• CICA-SS041D-09C		1145	SO	JF+MS	X											DUPLICATE				
• CICA-SS042-09C		1155	SO	JF+MS	X											MSD7				
• CICA-SS042-09C-SD		1155	SO	JF+MS	X															
• CICA-SS042-09C-MS		1155	SO	JF+MS	X											MS				
• CICA-SS163-09C		1210	SO	DH	X															
• CICA-SS163D-09C		1215	SO	DH	X															
• CICA-SS162-09C		1155	SO	DH	X															
Relinquished By:					Date/Time		Received By:					Relinquished By:					Received for Laboratory By:		Date/Time	
Relinquished By:					Date/Time		Received By:					Date/Time		Shipper:		Airbill No.:				
Relinquished By:					Date/Time		Received By:					Lab Comments:					Temp:			

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of Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time														
Client: Ch2m Hill					# of Containers														
Send Results To: Genevieve Macero					Container Type: B02r B02ar														
Address: 5700 Cleveland St Ste 101					Preservative Used: NONE NONE														
Virginia Beach VA 23462					Type of Analysis: Aspartic acid, Glycine, Copper, Lead, pH														
Phone: 757-671-6284					Lab Cooler No.														
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials														CLIENT COMMENTS	
CA-SS189-09C	7/8/09	1230	SO	DH	X														
CA-SS190-09C	7/8/09	1240	SO	DH	X														
CA-SS040-09C	7/8/09	1245	SO	JF/MS	X														
CA-SS037-09C	7/8/09	1230	SO	JF/MS	X														
CA-SS044-09C	7/8/09	1320	SO	JF/MS	X	X													
CA-SS043-09C	7/8/09	1310	SO	JF/MS	X														
CA-SS070-09C	7/8/09	1415	Blank	EM	X													Equipment Blank	
CA-SS119-09C	7/8/09	1345	SO	EB/mw	X														
CA-SS120-09C	7/8/09	1355	SO	EB/mw	X														
CA-SS123-09C	7/8/09	1430	SO	EB/mw	X														
CA-SS049-09C	7/8/09	1400	SO	JF/MS	X														
CA-SS049-09C-MS	7/8/09	1400	SO	JF/MS	X													MS	
Relinquished By: [Signature]		Date/Time: 7/8/09 1630	Received By:			Relinquished By:				Received for Laboratory By:				Date/Time:					
Relinquished By:		Date/Time:	Received By:			Date/Time:		Shipper:		Airbill No.:									
Relinquished By:		Date/Time:	Received By:			Lab Comments:				Temp:									

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of

Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time									
Client: CH2M Hill					# of Containers									
Send Results To: Genevieve Moore					Container Type									
Address: 5700 Cleveland St Ste 101					Preservative Used									
Virginia Beach VA 23462					Type of Analysis									
Phone: 757-671-6284					Lab Cooler No.									
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS									
CA-SS049-09C	7/16/09	1400	SO	JF/ms	MSD									
CA-SS052-09C	7/16/09	1345	SO	JF/ms										
CA-SS193D-09C	7/16/09	1440	SO	DH	DUPLICATE									
CA-SS193-09C	7/16/09	1435	SO	DH										
CA-SS192-09C	7/16/09	1425	SO	DH										
CA-SS052-09C	7/16/09	1345	SO	JF/ms										
CA-SS116-09C	7/16/09	1320	SO	EB/mw										
CA-SS117-09C		1330	SO	EB/mw										
CA-SS122-09C		1420	SO	EB/mw										
CA-SS046-09C		1445	SO	JF/ms										
CA-SS046D-09C		1445	SO	JF/ms										
CA-SS047-09C		1510	SO	JF/ms										
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time			
[Signature]		7/16/09 1630												
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:						
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:				

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3 of 3 Pgs.

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1 inch = 350 feet

**Figure 1**

Former Range Area TR-02-1 Sample Locations  
Preliminary Assessment/Site Inspection  
Camp Johnson Construction Area  
MCB Camp Lejeune  
North Carolina





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Project: CTO-II Camp Johnson					Turnaround Time													
Client: CH2M Hill					# of Containers													
Send Results To: Genevieve Moore					Container Type													
Address: 5700 Cleveland St					Preservative Used													
Virginia Beach, VA					Type of Analysis													
Phone: 757-671-6284					Lab Cooler No.													
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials														CLIENT COMMENTS
CJCA-TW29-09C	7/25	16:45	AQ	KS	X													
CJCA-TW30-09C	7/25	18:10	AQ	KR	X													
CJCA-TW33-09C	7/25	17:20	AQ	DS	X													
CJCA-TW16-09C	7/25	17:05	AQ	DS	X													
CJCA-TW32-09C	7/25	13:30	AQ	DS	X													
CJCA-C201-072509-15	7/25	7:50	AQ	BP	X													
CJCA-TW18-09C	7/26	11:05	AQ	DS	X													
CJCA-TW20-09C	7/26	10:15	AQ	DS	X													
CJCA-TW21-09C	7/26	9:20	AQ	KS	X													
CJCA-TW19-09C	7/26	11:00	AQ	KS	X													
CJCA-TW12-09C	7/26	13:50	AQ	KS	X													
CJCA-TW14-09C	7/26	13:20	AQ	DS	X													
Relinquished By:		Date/Time	Received By:		Relinquished By:				Received for Laboratory By:				Date/Time					
R. S. Shaw		7/27 5:15																
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:										
Relinquished By:		Date/Time	Received By:		Lab Comments:							Temp:						

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Contract #/Billing Reference

of Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time																
Client: CH2M Hill					# of Containers																
Send Results To: Genevieve Moore					Container Type																
Address: 5700 Cleveland St. Virginia Beach, VA					Preservative Used																
Phone: 757-671-6254					Type of Analysis																
					Lab Cooler No.																
					CLIENT COMMENTS																
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials																	
CJCA-SB05-2-7-09C	7/25	11:55	SO	DB	X																
CJCA-SB13-2-7-09C	7/26	8:40	SO	DB	X														parent sample		
CJCA-SB13-2-7-09C-MS	7/26	8:40	SO	DB	X														MS		
CJCA-SB13-2-7-09C-SD	7/26	8:40	SO	DB	X														MSD		
CJCA-SB03-2-7-09C	7/26	10:30	SO	DB	X	X															
CJCA-SB03-2-7-09C	7/26	14:10	SO	DB	X																
CJCA-SB05-2-7-09C	7/26	15:05	SO	SB	X																
CJCA-SB07-4-7-09C	7/26	10:45	SO	SB	X																
CJCA-SB11-2-7-09C	7/26	13:10	SO	SB	X	X															
CJCA-SB09-2-4-09C	7/26	8:45	SO	SB	X																
CJCA-SB09D-2-4-09C	7/26	8:50	SO	SB	X																
Relinquished By: RAShaw					Date/Time: 7/27 5:15		Received By:					Relinquished By:					Received for Laboratory By:			Date/Time:	
Relinquished By:					Date/Time:		Received By:					Date/Time:		Shipper:			Airbill No.:				
Relinquished By:					Date/Time:		Received By:					Lab Comments:					Temp:				

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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: CTO-II Camp Johnson					Turnaround Time												
Client: CH2M Hill					# of Containers												
Send Results To: Genevieve Moore					Container Type												
Address: 5700 Cleveland St.					Preservative Used												
Virginia Beach, VA					Type of Analysis												
Phone: 757-671-6284					Lab Cooler No.												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS		
IRIS-5802-2	7/26	16:15	SO	DB	X	X	X										
IRIS-5802D-2	7/26	16:20	SO	DB	X	X	X										
IRIS-TP01-072609	7/26	17:00	AQ	RS	X												
EXA-5807-7-09C	7/26	10:45	SO	SB													
EXA-5811-7-09C	7/26	13:10	SO	SB													
EXA-5817-7-09C	7/26	8:45	SO	SB													
EXA-5804D-7-09C	7/26	8:50	SO	SB													
IRIS-5805-2-7-09C	7/27	9:45	SO	DB	X	X	X									parent sample	
IRIS-5805-2-7-09C-HS	7/27	9:45	SO	DB	X	X	X									MS	
IRIS-5805-2-7-09C-SD	7/27	9:45	SO	DX	X	X	X									MSD	
Relinquished By: RAShaw					Date/Time: 7/27 5:15		Received By:			Relinquished By:			Received for Laboratory By:			Date/Time:	
Relinquished By:					Date/Time:		Received By:			Date/Time:		Shipper:		Airbill No.:			
Relinquished By:					Date/Time:		Received By:			Lab Comments:					Temp:		

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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: C70-11 Camp Johnson					Turnaround Time 5 days																								
Client: CH2M Hill					# of Containers 1 3 1 1																								
Send Results To: Genevieve Moore					Container Type 12 1/2 gal 40ml vial 500ml																								
Address: 5700 Cleveland St.					Preservative Used HNO <sub>3</sub> HCl																								
Virginia Beach, VA					Type of Analysis Pb, Cu, Zn, As, Ni, Cr, Cd, Hg, Se, V, Mn, Fe, Co, Ni, Pb, Zn, Cu, Al, Si, K, Na, Ca, Mg, S, P, Cl, F, Br, I, B, Li, Rb, Cs, Sr, Ba, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc, Y, Zr, Hf, Ta, Nb, Mo, Sn, Sb, Te, Bi, Po, At, Rn, Fr, Ra, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, Lr																								
Phone: 757-671-0284					Lab Cooler No.																								
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS																								
C70A-TW26-09C	7/27	12:05	AQ	DS	X																								
C70A-TW25-09C	7/27	10:25	AQ	DS	X																								
C70A-TW24-09C	7/27	9:25	AQ	DS	X																								
C70A-TW24B-09C	7/27	9:30	AQ	DS	X																								
IRIS-TW24-09C	7/27	10:35	AQ	KS		X																							
IRIS-SB04-2-3-09C	7/27	9:00	SO	DB		X	X	X																					
IRIS-SB04-2-4-09C	7/27	12:10	SO	DB		X	X	X																					
IRIS-SB04-2-7-09C	7/27	11:10	SO	DB		X	X	X																					
Relinquished By: RJA Shaw					Date/Time: 7/27 5:15					Received By:					Relinquished By:					Received for Laboratory By:					Date/Time:				
Relinquished By:					Date/Time:					Received By:					Date/Time:					Shipper:					Airbill No.:				
Relinquished By:					Date/Time:					Received By:					Lab Comments:					Temp:									

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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: C70-11 Camp Johnson					Turnaround Time 5 days																								
Client: CH2M Hill					# of Containers 1 3 1 1																								
Send Results To: Genevieve Moore					Container Type 12 1/2 gal 40ml vial 500ml																								
Address: 5700 Cleveland St.					Preservative Used HNO <sub>3</sub> HCl																								
Virginia Beach, VA					Type of Analysis Pb, Cu, Zn, As, (60108) VOC SVOC/PAHs PCB Total Metals PH																								
Phone: 757-671-0284					Lab Cooler No.																								
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS																								
C70A-TW20-09C	7/27	12:05	AQ	DS	X																								
C70A-TW25-09C	7/27	10:25	AQ	DS	X																								
C70A-TW24-09C	7/27	9:25	AQ	DS	X																								
C70A-TW240-09C	7/27	9:30	AQ	DS	X																								
IRIS-TW1-032309	7/27	10:35	AQ	KS		X																							
IRIS-SB04-2-3-09C	7/27	9:00	SO	DB		X	X	X																					
IRIS-SB07-2-4-09C	7/27	12:10	SO	DB		X	X	X																					
IRIS-SB06-2-7-09C	7/27	11:10	SO	DB		X	X	X																					
Relinquished By: RJA Shaw					Date/Time: 7/27 5:15					Received By:					Relinquished By:					Received for Laboratory By:					Date/Time:				
Relinquished By:					Date/Time:					Received By:					Date/Time:					Shipper:					Airbill No.:				
Relinquished By:					Date/Time:					Received By:					Lab Comments:										Temp:				

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7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: CTU-11 Camp Johnson					Turnaround Time												
Client: CH2M Hill					# of Containers												
Send Results To: Genevieve Moore					Container Type												
Address: 5700 Cleveland St. Virginia Beach, VA					Preservative Used												
Phone: 757-671-6284					Type of Analysis												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.										CLIENT COMMENTS		
CJCA-SB15- 6-3-09C	7/25	17:40	SO	DB	X												
CJCA-SB20- 2-3-09C	7/25	17:03	SO	SB	X												
CJCA-SB200H 7-7-09C	7/25	17:08	SO	SB	X												
CJCA-SB18-2 -5-09C	7/25	16:55	SO	SB	X	X											
CJCA-SB21- 4-3-09C	7/25	16:35	SO	SB	X												
CJCA-SB41- 2-4-09C	7/25	16:00	SO	DB	X												
CJCA-SB14- 2-3-09C	7/25	14:00	SO	SB	X												
CJCA-SB24- 2-4-09C	7/24	12:15	SO	SB	X												
CJCA-SB15- 2-4-09C	7/25	8:40	SO	DB	X												parent sample
CJCA-SB35- 2-4-09C-MS	7/25	8:40	SO	DB	X												MS
CJCA-SB35- 2-4-09C-SD	7/25	8:40	SO	DB	X												MSD
CJCA-SB13-47 -6-7-09C	7/25	10:10	SO	DB	X												
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time						
RJAShaw		7/27 5:15															
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:									
Relinquished By:		Date/Time	Received By:		Lab Comments:						Temp:						

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Contract #/Billing Reference

of	Pgs.
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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time											
Client: CH2M 11-11					# of Containers											
Send Results To: Genevieve Moore					Container Type											
Address: 5700 Cleveland St.					Preservative Used											
Virginia Beach, VA					Type of Analysis											
Phone: 757-671-6284					Lab Cooler No.											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS	
CJCA-SB115-2-4-09C	7/22	17:15	SO	DB	X											
CJCA-SB117-6-3-09C	7/22	15:45	SO	DB	X	X										
CJCA-SB118-4-6-09C	7/22	16:30	SO	DB	X											
CJCA-SB119-11-3-09C	7/22	17:50	SO	SB	X											
CJCA-SB120-2-5-09C	7/22	17:10	SO	SB	X											
CJCA-SB121-2-5-09C	7/22	17:15	SO	SB	X											
CJCA-SB122-2-4-09C	7/22	16:30	SO	SB	X											
CJCA-SB123-2-4-09C	7/23	10:10	SO	DB	X											
CJCA-SB124-7-4-09C	7/23	11:00	SO	SB	X											
CJCA-SB125-4-11-09C	7/23	9:10	SO	SB	X											
CJCA-SB126-4-7-09C	7/23	10:45	SO	SB	X											
CJCA-SB127-4-7-09C	7/23	10:50	SO	SB	X											
Relinquished By:		Date/Time		Received By:		Relinquished By:		Received for Laboratory By:		Date/Time						
RJAShaw		7/23 5:30														
Relinquished By:		Date/Time		Received By:		Date/Time		Shipper:		Airbill No.:						
Relinquished By:		Date/Time		Received By:		Lab Comments:							Temp:			

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**GPL LABORATORIES, LLC**

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Frederick, MD 21703  
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Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

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**G.P. W.O.**



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7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of Pgs.

Project: CTO-11 Camp Johnson					Turnaround Time												
Client: CH2M Hill					# of Containers												
Send Results To: Genevieve Moore					Container Type												
Address: 5700 Cleveland St.					Preservative Used												
Virginia Beach, VA					Type of Analysis												
Phone: 757-671-6284					Lab Cooler No.												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS		
CJCA-SB55-4 -4-09C	7/22	10:20	SO	DB	X												
CJCA-SB52-2 -4-09C	7/22	10:25	SO	SB	X	X											
CJCA-SB61-2 -4-09C	7/22	9:30	SO	DB	X												
CJCA-SB54- -4-7-09C	7/22	10:50	SO	DB	X												Parent Sample
CJCA-SB54- -4-7-09C	7/22	10:50	SO	DB	X												MS
CJCA-SB54- -4-7-09C-SB	7/22	10:50	SO	DB	X												MSD
CJCA-SB54- -4-6-09C	7/22	13:50	SO	DB	X												
CJCA-SBTOD -4-6-09C	7/22	13:55	SO	DB	X												
CJCA-SB62- -2-4-09C	7/22	13:20	SO	DB	X												
CJCA-SB68- -4-6-09C	7/22	14:20	SO	DB	X												
CJCA-SB60- -4-6-09C	7/22	14:45	SO	DB	X												
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time						
R. Shaw		7/22 5:30															
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:									
Relinquished By:		Date/Time	Received By:		Lab Comments:					Temp:							

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# GPL LABORATORIES, LLC

7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

Contract #/Billing Reference

of

Pgs.

Project: CTD-11					Turnaround Time												
Client: CH2M Hill					# of Containers 3												
Send Results To: Genevieve Moore					Container Type 40mL												
Address: 5700 Cleveland St Ste 101					Preservative Used HCl												
Virginia Beach, VA					Type of Analysis												
Phone: 757-671-6244					Lab Cooler No.												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	CLIENT COMMENTS												
IR17-TW01-07C	7/29/09	1415	GW		VOCs												
IR15-TW06-07C	7/30/09	0945	GW														
IR15-TW08-07C	7/30/09	0950	GW														
IR15-TB07-07C	7/30/09	1200	Blank														
IR15-TW09-07C	7/30/09	1200	Blank														
IR15-TW05-07C	7/30/09	1200	GW														
IR15-TW07-07C	7/30/09	0910	GW														
IR15-TW07-07C	7/30/09	1245	Blank														
Relinquished By: [Signature]					Date/Time: 7/30/09		Received By:			Relinquished By:			Received for Laboratory By:			Date/Time:	
Relinquished By:					Date/Time:		Received By:			Date/Time:		Shipper:		Airbill No.:			
Relinquished By:					Date/Time:		Received By:			Lab Comments:					Temp:		

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7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
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Contract #/Billing Reference

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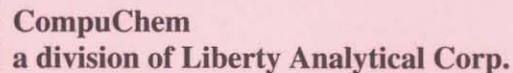
7210A Corporate Court  
Frederick, MD 21703  
(301) 694-5310  
Fax (301) 620-0731

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Pgs.

**G.P. W.O.**





Phone: 919-379-4100 Fax 919-379-4040

Page \_\_\_\_\_ of \_\_\_\_\_

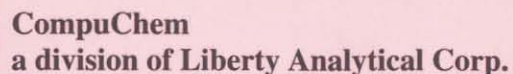
Sampling Complete? Y or N

[illegible]

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer





501 Madison Ave.

Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

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Sampling Complete? Y or N

[illegible]

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Courier

Airbill No.

Sampling Complete? Y or N

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Samples stored 60 days after date report mailed at no extra charge.

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CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB01	CJCA-SB02	CJCA-SB03	CJCA-SB04	CJCA-SB05	CJCA-SB06	CJCA-SB07	CJCA-SB08	CJCA-SB09		CJCA-SB10	CJCA-SB11	CJCA-SB12
Sample ID	CJCA-SB01-2-7-09C	CJCA-SB02-2-6-09C	CJCA-SB03-2-7-09C	CJCA-SB04-4-7-09C	CJCA-SB05-2-7-09C	CJCA-SB06-2-7-09C	CJCA-SB07-4-7-09C	CJCA-SB08-2-7-09C	CJCA-SB09-2-4-09C	CJCA-SB09D-2-4-09C	CJCA-SB10-2-6-09C	CJCA-SB11-2-7-09C	CJCA-SB12-2-7-09C
Sample Date	07/26/09	07/29/09	07/26/09	07/29/09	07/26/09	07/29/09	07/26/09	07/29/09	07/26/09	07/26/09	07/28/09	07/26/09	07/29/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.7 U	0.21 J-	1.9 U	1.6 UJ	1.7 U	1.5 UJ	1.5 U	1.6 UJ	1.6 U	1.7 U	1.6 UJ	1.5 U	1.5 UJ
Arsenic	0.61 J	1.8 U	0.57 J	0.48 J	0.67 J	0.72 J	0.51 J	4.4	1.3 J	0.81 J	0.25 J	1.3 J	1.1 J
Copper	0.28 J	1.4 J	0.55 J	0.48 J	0.77 J	0.47 J	0.51 J	0.72 J	3	6.9	0.64 J	0.55 J	0.58 J
Lead	3.4	4.2	4.3	2.6	3.3	1.9	1.8	4	4.7	4.5	2.5	2.5	2
Zinc	4.2 U	4.6 U	4.8 U	4.1 U	4.1 U	3.7 U	3.8 U	3.9 U	16	49	4 U	3.8 U	3.8 U
Wet Chemistry													
pH (ph)	NA	NA	3.6	NA	NA	NA	NA	NA	NA	NA	NA	4.7	NA

Notes:

- Shading indicates detections
- NA - Not analyzed
- J - Analyte present, value may or may not be accurate or precise
- J- - Analyte present, value may be biased low, actual value may be higher
- J+ - Analyte present, value may be biased high, actual value may be lower
- U - The material was analyzed for, but not detected
- UJ - Analyte not detected, quantitation limit may be inaccurate
- mg/kg - Milligrams per kilogram
- ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB13	CJCA-SB14	CJCA-SB15	CJCA-SB16	CJCA-SB18	CJCA-SB19	CJCA-SB20		CJCA-SB21	CJCA-SB22	CJCA-SB23	CJCA-SB24	CJCA-SB25
Sample ID	CJCA-SB13-2-7-09C	CJCA-SB14-2-7-09C	CJCA-SB15-6-7-09C	CJCA-SB16-2-7-09C	CJCA-SB18-2-5-09C	CJCA-SB19-2-7-09C	CJCA-SB20-2-7-09C	CJCA-SB20D-2-7-09C	CJCA-SB21-2-7-09C	CJCA-SB22-4-7-09C	CJCA-SB23-2-3-09C	CJCA-SB24-2-4-09C	CJCA-SB25-6-7-09C
Sample Date	07/26/09	07/28/09	07/25/09	07/25/09	07/25/09	07/28/09	07/25/09	07/25/09	07/28/09	07/25/09	07/28/09	07/24/09	07/28/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.8 U	1.5 UJ	1.6 U	1.5 U	1.7 U	1.6 UJ	1.7 U	1.8 U	1.5 UJ	1.5 U	1.6 UJ	1.6 U	1.9 UJ
Arsenic	1.2 J	0.17 J	3.8 U	1.5 U	1.7 U	0.62 J	1.7 U	2.6 U	0.45 J+	1.5 U	0.79 J+	1.6 U	13.2 J+
Copper	0.51 J	0.27 J	1.3 J	0.77 J	0.55 J	0.35 J	1.7 U	1.9	0.53 J	1.5 U	0.34 J	0.54 J	4.3
Lead	2.6	1.6	6.2	3.1	3.2	2.2	1.5 J	7	2.7	1.5	5	6.8	12.1
Zinc	4.6 U	3.8 U	4.4	3.7 U	2.1 J	3.9 U	4.1 U	4.1 U	3.8 U	3.7 U	3.9 U	6.5	9.6
Wet Chemistry													
pH (ph)	NA	NA	NA	NA	4.4	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

- Shading indicates detections
- NA - Not analyzed
- J - Analyte present, value may or may not be accurate or precise
- J- - Analyte present, value may be biased low, actual value may be higher
- J+ - Analyte present, value may be biased high, actual value may be lower
- U - The material was analyzed for, but not detected
- UJ - Analyte not detected, quantitation limit may be inaccurate
- mg/kg - Milligrams per kilogram
- ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB26	CJCA-SB27	CJCA-SB28	CJCA-SB29	CJCA-SB30	CJCA-SB31		CJCA-SB32	CJCA-SB33	CJCA-SB34	CJCA-SB35	CJCA-SB36	CJCA-SB37
Sample ID	CJCA-SB26-4-7-09C	CJCA-SB27-4-7-09C	CJCA-SB28-2-4-09C	CJCA-SB29-2-7-09C	CJCA-SB30-2-7-09C	CJCA-SB31-4-7-09C	CJCA-SB31D-4-7-09C	CJCA-SB32-2-7-09C	CJCA-SB33-4-6-09C	CJCA-SB34-2-4-09C	CJCA-SB35-2-4-09C	CJCA-SB36-4-7-09C	CJCA-SB37-6-7-09C
Sample Date	07/23/09	07/28/09	07/23/09	07/28/09	07/23/09	07/23/09	07/23/09	07/22/09	07/23/09	07/28/09	07/25/09	07/28/09	07/24/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.9 UJ	1.9 UJ	1.7 UJ	1.9 UJ	1.8 U	1.9 U	2 U	1.9 U	1.8 U	1.7 UJ	1.7 U	1.9 UJ	1.9 UJ
Arsenic	6.9	8.9 J+	2.6	11	4.5 J-	13.7 J-	14.5 J-	15.8 J-	3.7 J-	20.8 J+	1.7 U	3.3 J+	4.2
Copper	2.7 U	3.6	1.7 U	4.1	3.1	4	4.1	3.9	2.7	3.6	0.99 J	2.2	3.5
Lead	8.6	12.9	7.8	13.7	12.5	14.9	16.4	13.1	12	9.7	13.6	11.2	10.4
Zinc	6.9	8.3	4.3 U	7.6	5	7.8	7.2	8.3	7.4	5.2	4.3 U	6.8	8.9
Wet Chemistry													
pH (ph)	NA	NA	NA	4.2	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Shading indicates detections
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NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
  
J+ - Analyte present, value may be biased high, actual value may be lower  
  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB38	CJCA-SB39	CJCA-SB40	CJCA-SB41	CJCA-SB42	CJCA-SB43	CJCA-SB44	CJCA-SB45		CJCA-SB46	CJCA-SB47	CJCA-SB48	CJCA-SB49
Sample ID	CJCA-SB38-2-4-09C	CJCA-SB39-2-4-09C	CJCA-SB40-4-7-09C	CJCA-SB41-4-6-09C	CJCA-SB42-2-7-09C	CJCA-SB43-6-7-09C	CJCA-SB44-6-7-09C	CJCA-SB45-2-5-09C	CJCA-SB45D-2-5-09C	CJCA-SB46-4-7-09C	CJCA-SB47-6-7-09C	CJCA-SB48-4-6-09C	CJCA-SB49-2-4-09C
Sample Date	07/24/09	07/23/09	07/28/09	07/23/09	07/28/09	07/22/09	07/23/09	07/22/09	07/22/09	07/27/09	07/25/09	07/27/09	07/25/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.7 UJ	1.9 UJ	2 UJ	1.7 U	2 UJ	1.9 U	2 U	1.8 U	1.8 U	2 UJ	1.9 U	1.8 UJ	1.6 U
Arsenic	2.6	13.1	7.4 J+	2.6 J-	17.7 J+	5.3 J-	17.8 J-	11.6 J-	2.9 J-	14.4 J+	6.5	5.7 J+	3 U
Copper	1.8 U	2.6 U	4.1	1.3 J	4.2	3.2	4.7	4.4	2.1	2.5	2.5	2.2	1.3 J
Lead	7.5	11.9	14.6	8.2	14.2	12	14.5	16.1	11.1	11	11.9	8.7	7.6
Zinc	4.2 U	6.4	7.9	3.3 J	8.2	7.9	7.9	5	5.3	6.5	7.6	6.9	4.2
Wet Chemistry													
pH (ph)	NA	NA	4.4	NA	NA	NA	NA	NA	NA	NA	NA	4.6	NA

Notes:

Shading indicates detections

NA - Not analyzed  
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J+ - Analyte present, value may be biased high, actual value may be lower  
  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB50		CJCA-SB51	CJCA-SB52	CJCA-SB53	CJCA-SB54	CJCA-SB55	CJCA-SB56	CJCA-SB57	CJCA-SB58	CJCA-SB59		CJCA-SB60
Sample ID	CJCA-SB50-4-6-09C	CJCA-SB50D-4-6-09C	CJCA-SB51-2-7-09C	CJCA-SB52-4-6-09C	CJCA-SB53-2-7-09C	CJCA-SB54-6-7-09C	CJCA-SB55-4-6-09C	CJCA-SB56-2-7-09C	CJCA-SB57-2-4-09C	CJCA-SB58-2-6-09C	CJCA-SB59-2-4-09C	CJCA-SB59D-2-4-09C	CJCA-SB60-4-6-09C
Sample Date	07/27/09	07/27/09	07/25/09	07/27/09	07/22/09	07/22/09	07/22/09	07/27/09	07/23/09	07/27/09	07/23/09	07/23/09	07/22/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.7 UJ	1.7 UJ	1.8 U	1.7 UJ	1.8 U	1.8 U	1.9 U	1.7 UJ	1.7 U	1.8 UJ	1.8 U	1.8 U	1.8 U
Arsenic	6 J+	4.6 J+	2.4	0.98 J+	21.1 J+	14.3 J+	9.2 J+	4.5 J+	2.3 J-	1.9 J+	3.9 J-	3.5 J-	14.8 J+
Copper	1.8	1.7	1.3 J	0.49 J	3.5	3.6	3	1.9	0.75 J	2	3	2.3	4.6
Lead	8.7	8.8	7.5	6.1	11.6	14	12.1	8.5	5.9	9	11.5	10.1	17.3
Zinc	5	5.5	4.4 U	4.2 U	7.7	6.3	5.7	4.4 U	3.3 J	5.3	6.7	6.3	7.7
Wet Chemistry													
pH (ph)	NA	NA	NA	NA	4.3	NA	NA	NA	NA	4.4	NA	NA	NA

**Notes:**

Shading indicates detections

NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
  
J+ - Analyte present, value may be biased high, actual value may be lower  
  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB61	CJCA-SB62	CJCA-SB63	CJCA-SB64		CJCA-SB65	CJCA-SB66	CJCA-SB67	CJCA-SB68	CJCA-SB69	CJCA-SB70		CJCA-SB71
Sample ID	CJCA-SB61-2-4-09C	CJCA-SB62-2-4-09C	CJCA-SB63-2-4-09C	CJCA-SB64-4-7-09C	CJCA-SB64D-4-7-09C	CJCA-SB65-2-4-09C	CJCA-SB66-4-6-09C	CJCA-SB67-6-7-09C	CJCA-SB68-4-6-09C	CJCA-SB69-6-7-09C	CJCA-SB70-4-6-09C	CJCA-SB70D-4-6-09C	CJCA-SB71-6-7-09C
Sample Date	07/22/09	07/22/09	07/23/09	07/27/09	07/27/09	07/22/09	07/22/09	07/22/09	07/22/09	07/21/09	07/22/09	07/22/09	07/21/09
Chemical Name													
Total Metals (mg/kg)													
Antimony	1.6 U	1.8 U	1.6 U	1.9 UJ	2 UJ	1.7 U	2 U	1.9 U	1.8 U	2.1 U	2 U	1.9 U	3.7 U
Arsenic	1.1 J+	4.7 J+	2.6 J-	12 J+	15 J+	5.6 J-	12.3 J-	11.6 J-	11.6 J+	10.1 J-	14.2 J+	4.7 J+	46.5 J-
Copper	1 J	3.2	0.65 J	4.6	4.2	0.84 J	2.9	4.5	3.7	4	4	3.7	6.8
Lead	4.9	10.8	5	14.4	13.3	7.2	9.7	15.6	13.7	15.4	15.4	14.4	17.6
Zinc	3.9 U	6.6	2 J	8.7	9	3.2 J	8.7	8.2	7.4	7.9	8	8	9.7
Wet Chemistry													
pH (ph)	NA	NA	NA	NA	NA	NA	NA	4.6	NA	NA	NA	NA	NA

Notes:

Shading indicates detections
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NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
  
J+ - Analyte present, value may be biased high, actual value may be lower  
  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units



CTO-11  
Camp Lejeune - CJCA  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	CJCA-SB72	CJCA-SB73	CJCA-SB74	CJCA-SB75	CJCA-SB76	CJCA-SB77	CJCA-SB78
Sample ID	CJCA-SB72-4-6-09C	CJCA-SB73-4-6-09C	CJCA-SB74-2-7-09C	CJCA-SB75-4-6-09C	CJCA-SB76-4-6-09C	CJCA-SB77-2-4-09C	CJCA-SB78-4-6-09C
Sample Date	07/21/09	07/21/09	07/21/09	07/21/09	07/21/09	07/21/09	07/21/09
Chemical Name							
Total Metals (mg/kg)							
Antimony	1.9 U	1.9 U	1.7 U	1.9 U	1.8 U	1.5 U	3.5 U
Arsenic	21.3 J-	14.1 J-	1.1 J-	7 J-	4.9 J-	0.92 J-	24.8 J-
Copper	5.4	4.2	0.66 J	4.1	3.5	0.5 J	6.3
Lead	13.8	14	4	14.2	10.4	4.1	14.8
Zinc	8.4	8.9	4.2 U	8.1	5.4	3.8 U	10.2
Wet Chemistry							
pH (ph)	NA	4.6	NA	NA	NA	NA	NA

Notes:

- Shading indicates detections
- NA - Not analyzed
- J - Analyte present, value may or may not be accurate or precise
- J- - Analyte present, value may be biased low, actual value may be higher
- J+ - Analyte present, value may be biased high, actual value may be lower
- U - The material was analyzed for, but not detected
- UJ - Analyte not detected, quantitation limit may be inaccurate
- mg/kg - Milligrams per kilogram
- ph - pH units



Table 5-9  
Former Range Area Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej  
North Carolina

Station ID	CJCA-TW01	CJCA-TW02	CJCA-TW03	CJCA-TW04	CJCA-TW05	CJCA-TW06	CJCA-TW08	CJCA-TW09	CJCA-TW10	CJCA-TW11	CJCA-TW12	CJCA-TW13	CJCA-TW14	CJCA-TW15		CJCA-TW16	CJCA-TW17	CJCA-TW18	CJCA-TW19	CJCA-TW20
Sample ID	CJCA-TW01-09C	CJCA-TW02-09C	CJCA-TW03-09C	CJCA-TW04-09C	CJCA-TW05-09C	CJCA-TW06-09C	CJCA-TW08-09C	CJCA-TW09-09C	CJCA-TW10-09C	CJCA-TW11-09C	CJCA-TW12-09C	CJCA-TW13-09C	CJCA-TW14-09C	CJCA-TW15-09C	CJCA-TW15D-09C	CJCA-TW16-09C	CJCA-TW17-09C	CJCA-TW18-09C	CJCA-TW19-09C	CJCA-TW20-09C
Sample Date	07/28/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09	07/27/09	07/26/09	07/27/09	07/27/09	07/26/09	07/26/09	07/26/09	07/26/09	07/26/09	07/25/09	07/24/09	07/26/09	07/26/09	07/26/09
Chemical Name																				
Total Metals (µg/l)																				
Antimony	100 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	20 U	20 U	20 U	3 J	20 U	20 U	2.2 J	20 U	2.6 J	20 U	20 U	20 U	2.9 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Copper	100 U	20 U	7.4 J	20 U	20 U	3.2 J	20 U	4.4 J	20 U	20 U	20 U	3.9 J	20 U	20 U	3.5 J	20 U	10.4 J	20 U	20 U	20 U
Lead	19.1 J	20 U	14.1 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	11.5 J	20 U	20 U	20 U
Zinc	250 U	18 J	18.5 J	4.5 J	18.2 J	8.4 J	6.9 J	14.3 J	10.4 J	18.6 J	6.5 J	17.4 J	36.8 J	6.9 J	14.2 J	32 J	160	112	7.5 J	81.5
Dissolved Metals (µg/l)																				
Antimony, Dissolved	20 U	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA
Arsenic, Dissolved	20 U	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA
Copper, Dissolved	20 U	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA
Lead, Dissolved	2 J	NA	20 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 U	NA	NA	NA
Zinc, Dissolved	50 U	NA	10.1 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	82.3	NA	NA	NA

Notes:

Shading indicates detections

NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
U - The material was analyzed for, but not detected  
µg/l - Micrograms per liter



Table 5-9  
Former Range Area Groundwater Analytical Results  
Camp Johnson Construction Area  
Focused PA/SI Report  
MCB CamLej  
North Carolina

Station ID	CJCA-TW21	CJCA-TW22	CJCA-TW23	CJCA-TW24		CJCA-TW25	CJCA-TW26	CJCA-TW27	CJCA-TW28	CJCA-TW29	CJCA-TW30	CJCA-TW31	CJCA-TW32	CJCA-TW33	CJCA-TW34	CJCA-TW35		CJCA-TW36	CJCA-TW37	CJCA-TW38
Sample ID	CJCA-TW21-09C	CJCA-TW22-09C	CJCA-TW23-09C	CJCA-TW24-09C	CJCA-TW24D-09C	CJCA-TW25-09C	CJCA-TW26-09C	CJCA-TW27-09C	CJCA-TW28-09C	CJCA-TW29-09C	CJCA-TW30-09C	CJCA-TW31-09C	CJCA-TW32-09C	CJCA-TW33-09C	CJCA-TW34-09C	CJCA-TW35-09C	CJCA-TW35D-09C	CJCA-TW36-09C	CJCA-TW37-09C	CJCA-TW38-09C
Sample Date	07/26/09	07/24/09	07/23/09	07/27/09	07/27/09	07/27/09	07/27/09	07/23/09	07/23/09	07/25/09	07/25/09	07/23/09	07/25/09	07/25/09	07/25/09	07/22/09	07/22/09	07/22/09	07/22/09	07/23/09
Chemical Name																				
Total Metals (µg/l)																				
Antimony	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	3.1 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	9.4 J	2.9 J	20 U	6.1 J	4 J	2.6 J	3.5 J	20 U	20 U	5.5 J	20 U	20 U
Copper	20 U	20 U	20 U	2.7 J	20 U	20 U	20 U	20 U	5.5 J	10 J	20 U	20 U	4.2 J	20 U	20 U	6.6 J	20 U	20 U	2.7 J	20 U
Lead	20 U	20 U	20 U	20 U	20 U	20 U	2 J	10.3 J	2.3 J	20 U	20 U	6.6 J	3.6 J	2.2 J	4.5 J	20 U	20 U	2 J	20 U	2.9 J
Zinc	21.2 J	5.6 J	69.8	11.6 J	14.8 J	14.3 J	11.9 J	63.5	56.7	15.1 J	16.9 J	91.6	53.8	77.6	19.7 J	8.3 J	10.4 J	4.3 J	42.6 J	30.9 J
Dissolved Metals (µg/l)																				
Antimony, Dissolved	NA	20 U	20 U	NA	NA	NA	NA	20 U	20 U	NA	NA	20 U	NA	NA	NA	20 U	20 U	20 U	20 U	20 U
Arsenic, Dissolved	NA	20 U	20 U	NA	NA	NA	NA	20 U	20 U	NA	NA	20 U	NA	NA	NA	20 U	20 U	4.9 J	20 U	20 U
Copper, Dissolved	NA	20 U	20 U	NA	NA	NA	NA	20 U	3.6 J	NA	NA	20 U	NA	NA	NA	20 U	20 U	20 U	3.1 J	20 U
Lead, Dissolved	NA	2 J	20 U	NA	NA	NA	NA	20 U	20 U	NA	NA	20 U	NA	NA	NA	20 U	20 U	20 U	20 U	20 U
Zinc, Dissolved	NA	4.3 J	32.4 J	NA	NA	NA	NA	50 U	39.6 J	NA	NA	61.7	NA	NA	NA	8 J	8.4 J	50 U	42.5 J	27 J

Notes:

Shading indicates detections

NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
U - The material was analyzed for, but not detected  
µg/l - Micrograms per liter



Station ID	IR15-SS01	IR15-SS02	IR15-SS03		IR15-SS04	IR15-SS05	IR15-SS06	IR15-SS07	IR15-SS08	IR15-SS09	IR15-SS10
Sample ID	IR15-SS01-00-01-09C	IR15-SS02-00-01-09C	IR15-SS03-00-01-09C	IR15-SS03D-00-01-09C	IR15-SS04-00-01-09C	IR15-SS05-00-01-09C	IR15-SS06-00-01-09C	IR15-SS07-00-01-09C	IR15-SS08-00-01-09C	IR15-SS09-00-01-09C	IR15-SS10-00-01-09C
Sample Date	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name											
Volatile Organic Compounds (µg/kg)											
1,1,1-Trichloroethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,1,2,2-Tetrachloroethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,1,2-Trichloroethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,1-Dichloroethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,1-Dichloroethene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,2,4-Trichlorobenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,2-Dibromo-3-chloropropane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,2-Dibromoethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,2-Dichlorobenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,2-Dichloroethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,2-Dichloropropane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
1,3-Dichlorobenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
1,4-Dichlorobenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
2-Butanone	22 J	9.2 R	8.5 UJ	11 R	4.4 J	NA	11 R	4.5 J	40 J	11 UJ	9.5 UJ
2-Hexanone	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 UJ	14 UJ	11 UJ	9.5 UJ
4-Methyl-2-pentanone	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 UJ	14 UJ	11 UJ	9.5 UJ
Acetone	240 J	9.2 R	14 J	11 R	52 J	NA	77 J	160 J	1,700 J	11 UJ	150 J
Benzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Bromodichloromethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Bromoform	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
Bromomethane	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 R	14 R	11 UJ	9.5 UJ
Carbon disulfide	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Carbon tetrachloride	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Chlorobenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
Chloroethane	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 U	14 UJ	11 UJ	9.5 UJ
Chloroform	5.2 J	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Chloromethane	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 U	14 UJ	11 UJ	9.5 UJ
cis-1,2-Dichloroethene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
cis-1,3-Dichloropropene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Cyclohexane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Dibromochloromethane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Dichlorodifluoromethane (Freon-12)	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
Ethylbenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Isopropylbenzene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Methyl acetate	5.8 UJ	4.6 R	4.2 UJ	5.4 R	4.5 J	NA	14 J	10 J	2,100	5.5 UJ	24 J
Methylcyclohexane	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Methylene chloride	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 U	14 UJ	11 UJ	9.5 UJ
Methyl-tert-butyl ether (MTBE)	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
Styrene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Tetrachloroethene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Toluene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	10 J	5.5 UJ	4.7 UJ
trans-1,2-Dichloroethene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
trans-1,3-Dichloropropene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 UJ	7 UJ	5.5 UJ	4.7 UJ
Trichloroethene	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Trichlorofluoromethane(Freon-11)	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Vinyl chloride	12 UJ	9.2 R	8.5 UJ	11 R	12 UJ	NA	11 R	11 U	14 UJ	11 UJ	9.5 UJ
Xylene, total	5.8 UJ	4.6 R	4.2 UJ	5.4 R	5.9 UJ	NA	5.4 R	5.3 U	7 UJ	5.5 UJ	4.7 UJ
Semivolatile Organic Compounds (µg/kg)											
1,1-Biphenyl	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,2'-Oxybis(1-chloropropane)	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,4,5-Trichlorophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,4-Dichlorophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,4-Dimethylphenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,4-Dinitrophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,4-Dinitrotoluene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2,6-Dinitrotoluene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Chloronaphthalene	190 U	180 UJ	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Chlorophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Methylnaphthalene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Methylphenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Nitroaniline	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
2-Nitrophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
3,3'-Dichlorobenzidine	190 UJ	180 UJ	190 UJ	190 UJ	180 UJ	180 UJ	170 UJ	180 UJ	210 UJ	190 U	180 U
3-Nitroaniline	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4,6-Dinitro-2-methylphenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Bromophenyl-phenylether	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Chloro-3-methylphenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Chloroaniline	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Chlorophenyl-phenylether	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Methylphenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Nitroaniline	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
4-Nitrophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Acenaphthene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Acenaphthylene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Acetophenone	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Anthracene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Atrazine	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Benzaldehyde	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Benzo(a)anthracene	39 U	36 U	38 UJ	38 U	37 U	36 U	35 U	36 U	42 U	37 U	36 U



Station ID	IR15-SS01	IR15-SS02	IR15-SS03		IR15-SS04	IR15-SS05	IR15-SS06	IR15-SS07	IR15-SS08	IR15-SS09	IR15-SS10
Sample ID	IR15-SS01-00-01-09C	IR15-SS02-00-01-09C	IR15-SS03-00-01-09C	IR15-SS03D-00-01-09C	IR15-SS04-00-01-09C	IR15-SS05-00-01-09C	IR15-SS06-00-01-09C	IR15-SS07-00-01-09C	IR15-SS08-00-01-09C	IR15-SS09-00-01-09C	IR15-SS10-00-01-09C
Sample Date	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name											
Benzo(a)pyrene	39 U	36 U	38 UJ	38 U	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Benzo(b)fluoranthene	39 U	36 U	38 UJ	38 U	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Benzo(g,h,i)perylene	190 U	180 UJ	190 UJ	95 J	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Benzo(k)fluoranthene	190 U	180 UJ	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
bis(2-Chloroethoxy)methane	190 U	180 UJ	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
bis(2-Chloroethyl)ether	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
bis(2-Ethylhexyl)phthalate	180 J	180 U	190 UJ	190 U	180 U	180 U	110 J	88 J	210 U	190 U	180 U
Butylbenzylphthalate	190 J	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Caprolactam	190 U	180 U	190 UJ	190 U	180 U	180 R	170 U	180 U	210 U	190 U	180 U
Carbazole	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Chrysene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Dibenz(a,h)anthracene	39 U	36 U	38 UJ	64 J	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Dibenzofuran	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Diethylphthalate	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Dimethyl phthalate	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Di-n-butylphthalate	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	120 J	150 J
Di-n-octylphthalate	190 UJ	180 UJ	190 UJ	190 UJ	180 UJ	180 UJ	170 UJ	180 UJ	210 UJ	190 U	180 U
Fluoranthene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Fluorene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Hexachlorobenzene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Hexachlorobutadiene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Hexachlorocyclopentadiene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Hexachloroethane	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Indeno(1,2,3-cd)pyrene	39 U	36 U	38 UJ	52 J	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Isophorone	39 U	36 U	38 UJ	38 U	37 U	36 U	35 U	36 U	42 U	37 U	36 U
Naphthalene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
n-Nitroso-di-n-propylamine	39 U	36 U	38 UJ	38 U	37 U	36 U	35 U	36 U	42 U	37 U	36 U
n-Nitrosodiphenylamine	190 U	180 UJ	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Nitrobenzene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Pentachlorophenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Phenanthrene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Phenol	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 U	180 U
Pyrene	190 U	180 U	190 UJ	190 U	180 U	180 U	170 U	180 U	210 U	190 UJ	180 U
Pesticide/Polychlorinated Biphenyls (µg/kg)											
4,4'-DDD	7.5 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	2.7	3.7
4,4'-DDE	25 J	1.8 U	0.75 J	0.88 J	1.9 U	1.8 U	0.56 J	1.1 J	2.1 J	21 J	22 J
4,4'-DDT	16 J	1.8 UJ	1 J	1.3 J	1.9 UJ	1.8 UJ	0.39 J	0.62 J	0.99 J	1.8 UJ	24 J
Aldrin	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
alpha-BHC	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
alpha-Chlordane	7.4 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.1 J	1 J
Aroclor-1016	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1221	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1232	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1242	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1248	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1254	360 J	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
Aroclor-1260	19 U	18 U	19 U	19 U	18 U	18 U	17 U	18 U	21 U	17 U	17 U
beta-BHC	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
delta-BHC	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Dieldrin	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.7 J	0.91 J
Endosulfan I	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Endosulfan II	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Endosulfan sulfate	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Endrin	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Endrin aldehyde	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Endrin ketone	1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	1.7 UJ	1.8 UJ	2.1 UJ	1.8 UJ	1.8 UJ
gamma-BHC (Lindane)	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
gamma-Chlordane	8.6 J	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	0.58 J	0.71 J
Heptachlor	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Heptachlor epoxide	1.9 U	1.8 U	1.9 U	1.9 U	1.9 U	1.8 U	1.7 U	1.8 U	2.1 U	1.8 UJ	1.8 UJ
Methoxychlor	1.9 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.8 UJ	1.7 UJ	1.8 UJ	2.1 UJ	1.8 UJ	1.8 UJ
Toxaphene	39 U	36 U	38 U	38 U	37 U	36 U	35 U	36 U	42 U	37 UJ	36 UJ
Total Metals (mg/kg)											
Aluminum	4,280	5,720	12,500	11,400	3,910 J+	1,150 J+	1,250 J+	1,380 J+	4,640 J+	7,490	6,340
Antimony	0.64 J-	1.5 UJ	1.6 UJ	1.6 UJ	1.6 U	1.6 U	0.27 J	0.27 J	0.34 J	1.5 UJ	1.5 UJ
Arsenic	1.7	0.76 J	4.1	4.7	1 J	0.24 J	0.39 J	0.49 J	2.1	4.1	2.7
Barium	34.3	9.2	15.7	14.8	6.5	4.6	2.9 J	4.3	17.5	12.6	13.6
Beryllium	0.055 J	0.039 J	0.14 J	0.14 J	0.16 U	0.16 U	0.15 U	0.16 U	0.18 U	0.076 J	0.1 J
Cadmium	0.61	0.45 U	0.49 U	0.49 U	0.015 J	0.47 U	0.014 J	0.054 J	0.11 J	0.044 J	0.45 U
Calcium	36,500	1,680	12,600	29,900	94.3	157	182	366	2,230	742	555
Chromium	7.2	5.7	17.1	17.2	4	1.7	1.4 J	1.9	6.2	10.2	8.4
Cobalt	0.57	0.24 J	0.57	0.56	0.086 J	0.069 J	0.38 U	0.067 J	0.45 U	0.42	0.3 J
Copper	42.1	1.1 J	2.9	3.2	0.73 J	0.54 J	1.4 J	1.9	13.1	4.1	7.9
Iron	5,010	1,620	9,030	10,200	2,410	559	903	930	3,430	6,430	5,270
Lead	70.3	3.7	9.1	12.1	3.9	3	9.1	12.2	38.6	11	19.4
Magnesium	312	197	614	796	103	46.7	53.7	60.4	247	339	263
Manganese	22.2	5.5	9.7	14	4.6	5.2	6.2	7.6	14.3	7.9	12.5
Mercury	0.51	0.034 U	0.035 U	0.041	0.034 U	0.034 U	0.033 U	0.019 J	0.039 U	0.044	0.049
Nickel	2.7	1.3	1.8	2.1	0.55 J	0.48 J	0.49 J	0.53 J	1.6	1.7	1.6
Potassium	184	287	497	475	109	78.8 U	76.3 U	78.8 U	220	367	249
Selenium	0.49 J	1.5 U	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	1.8 U	1.5 U	1.5 U



Station ID	IR15-SS01	IR15-SS02	IR15-SS03		IR15-SS04	IR15-SS05	IR15-SS06	IR15-SS07	IR15-SS08	IR15-SS09	IR15-SS10
Sample ID	IR15-SS01-00-01-09C	IR15-SS02-00-01-09C	IR15-SS03-00-01-09C	IR15-SS03D-00-01-09C	IR15-SS04-00-01-09C	IR15-SS05-00-01-09C	IR15-SS06-00-01-09C	IR15-SS07-00-01-09C	IR15-SS08-00-01-09C	IR15-SS09-00-01-09C	IR15-SS10-00-01-09C
Sample Date	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name											
Silver	1.6 U	1.5 U	1.6 U	1.6 U	1.6 U	0.17 J	1.5 U	1.6 U	1.8 U	1.5 U	1.5 U
Sodium	17.5 J	6.7 J	40.9 J	68.7 J	202 U	197 U	191 U	197 U	17.1 J	13.8 J	188 U
Thallium	2.4 U	2.3 U	2.4 U	2.4 U	2.4 U	2.4 U	2.3 U	2.4 U	2.7 U	2.3 U	2.3 U
Vanadium	7.5	7.2	20.1	22.3	5.5	2.2 J	2.3 J	2.7 J	8.9	18	13.2
Zinc	170	3.8 U	10	11.9	4 U	3.9 U	6	7.5	26.2	12.5	18
Wet Chemistry											
pH (ph)	7.8	8.3	7.9	8	4.7	4.8	4.8	5.6	5.6	5.2	5.5

Notes:

Shading indicates detections
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NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units  
µg/kg - Micrograms per kilogram



CTO-11  
Camp Lejeune - Site 15  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	IR15-SB01	IR15-SB02		IR15-SB03	IR15-SB04	IR15-SB05	IR15-SB06	IR15-SB07	IR15-SB08	IR15-SB09	IR15-SB10
Sample ID	IR15-SB01-4-6-09C	IR15-SB02-2-7-09C	IR15-SB02D-2-7-09C	IR15-SB03-2-7-09C	IR15-SB04-2-7-09C	IR15-SB05-2-7-09C	IR15-SB06-2-7-09C	IR15-SB07-2-4-09C	IR15-SB08-2-4-09C	IR15-SB09-2-7-09C	IR15-SB10-2-4-09C
Sample Date	07/29/09	07/26/09	07/26/09	07/29/09	07/27/09	07/27/09	07/27/09	07/27/09	07/29/09	07/29/09	07/29/09
Chemical Name											
Volatiles Organic Compounds (µg/kg)											
1,1,1-Trichloroethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,1,2,2-Tetrachloroethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,1,2-Trichloroethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,1-Dichloroethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,1-Dichloroethene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,2,4-Trichlorobenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	2.4 J	1.8 UJ	3.2 R	2.5 J	1.9 J	2.4 J	1.6 U
1,2-Dibromo-3-chloropropane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,2-Dibromoethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,2-Dichlorobenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,2-Dichloroethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,2-Dichloropropane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
1,3-Dichlorobenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.4 J	1.8 UJ	3.2 R	1.6 J	1.6 U	1.3 J	1.6 U
1,4-Dichlorobenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	1.6 J	1.6 U	1.4 J	1.6 U
2-Butanone	3.4 U	4 UJ	4.8 UJ	3.6 U	6.6 J	3.7 UJ	3.2 R	21 J	3.1 U	15 J	3.2 U
2-Hexanone	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.1 J	3.1 U	0.6 J	3.2 U
4-Methyl-2-pentanone	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 U	1.7 J	3.2 U
Acetone	3.4 U	42 J	39 J	6.4 J	41 J	19 J	60 J	120 J	18 J	180 J	4.6
Benzene	1.7 U	2 UJ	2.4 UJ	1.8 U	0.97 J	1.8 UJ	1.6 R	2.1 UJ	1.6 U	0.42 J	1.6 U
Bromodichloromethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Bromoform	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Bromomethane	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 R	3.9 R	3.2 U
Carbon disulfide	1.7 U	2 UJ	1.4 J	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Carbon tetrachloride	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Chlorobenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	2.6 J	1.6 U
Chloroethane	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 R	3.9 R	3.2 U
Chloroform	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Chloromethane	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 U	3.9 R	3.2 U
cis-1,2-Dichloroethene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
cis-1,3-Dichloropropene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Cyclohexane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Dibromochloromethane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Dichlorodifluoromethane (Freon-12)	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Ethylbenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Isopropylbenzene	1.7 U	2 UJ	2.4 UJ	1.8 U	3.9 UJ	1.8 UJ	3.2 R	4.2 UJ	2 U	2.6 R	1.6 U
Methyl acetate	1.7 U	1.9 J	3.5 J	1.8 U	1.9 UJ	7.8 J	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Methylcyclohexane	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Methylene chloride	3.4 UJ	2.2 J	3.1 J	3.6 UJ	2.9 J	8.9 J	3.2 R	3.3 J	3.1 U	3.9 R	3.2 UJ
Methyl-tert-butyl ether (MTBE)	1.7 UJ	2 UJ	2.4 UJ	1.8 UJ	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 UJ
Styrene	1.7 U	2 UJ	2.4 UJ	1.8 U	3.9 UJ	1.8 UJ	3.2 R	2.9 J	3.1 U	2.6 J	1.6 U
Tetrachloroethene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.5 J	1.6 U
Toluene	1.7 U	2 UJ	2.4 UJ	1.8 U	2.8 J	1.8 UJ	1.6 R	2.9 J	1.6 U	0.42 J	1.6 U
trans-1,2-Dichloroethene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
trans-1,3-Dichloropropene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Trichloroethene	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Trichlorofluoromethane(Freon-11)	1.7 U	2 UJ	2.4 UJ	1.8 U	1.9 UJ	1.8 UJ	1.6 R	2.1 UJ	1.6 U	1.9 R	1.6 U
Vinyl chloride	3.4 U	4 UJ	4.8 UJ	3.6 U	3.9 UJ	3.7 UJ	3.2 R	4.2 UJ	3.1 U	3.9 R	3.2 U
Xylene, total	1.7 U	2 UJ	2.4 UJ	1.8 U	7.8 UJ	1.8 UJ	6.4 R	8.3 UJ	3.1 U	3.9 R	1.6 U
Semivolatiles Organic Compounds (µg/kg)											
1,1-Biphenyl	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,2'-Oxybis(1-chloropropane)	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,4,5-Trichlorophenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,4-Dichlorophenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,4-Dimethylphenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,4-Dinitrophenol	190 U	190 UJ	190 UJ	190 U	210 U	190 UJ	180 U	210 U	190 U	200 U	180 U
2,4-Dinitrotoluene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2,6-Dinitrotoluene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Chloronaphthalene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Chlorophenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Methylnaphthalene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Methylphenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Nitroaniline	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
2-Nitrophenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
3,3'-Dichlorobenzidine	190 UJ	190 UJ	190 UJ	190 UJ	210 UJ	190 UJ	180 UJ	210 UJ	190 UJ	200 UJ	180 UJ
3-Nitroaniline	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4,6-Dinitro-2-methylphenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Bromophenyl-phenylether	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Chloro-3-methylphenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Chloroaniline	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Chlorophenyl-phenylether	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Methylphenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
4-Nitroaniline	190 UJ	190 UJ	190 UJ	190 UJ	210 UJ	190 UJ	180 UJ	210 UJ	190 UJ	200 UJ	180 UJ
4-Nitrophenol	190 U	190 UJ	190 UJ	190 U	210 U	190 UJ	180 U	210 U	190 U	200 U	180 U
Acenaphthene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Acenaphthylene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Acetophenone	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U



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Station ID	IR15-SB01	IR15-SB02		IR15-SB03	IR15-SB04	IR15-SB05	IR15-SB06	IR15-SB07	IR15-SB08	IR15-SB09	IR15-SB10
Sample ID	IR15-SB01-4-6-09C	IR15-SB02-2-7-09C	IR15-SB02D-2-7-09C	IR15-SB03-2-7-09C	IR15-SB04-2-7-09C	IR15-SB05-2-7-09C	IR15-SB06-2-7-09C	IR15-SB07-2-4-09C	IR15-SB08-2-4-09C	IR15-SB09-2-7-09C	IR15-SB10-2-4-09C
Sample Date	07/29/09	07/26/09	07/26/09	07/29/09	07/27/09	07/27/09	07/27/09	07/27/09	07/29/09	07/29/09	07/29/09
Chemical Name											
Anthracene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Atrazine	190 U	190 UJ	190 UJ	190 U	210 U	190 UJ	180 U	210 U	190 U	200 U	180 U
Benzaldehyde	190 R	190 UJ	190 UJ	190 R	210 R	190 R	180 R	210 R	190 R	200 R	180 R
Benzo(a)anthracene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Benzo(a)pyrene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Benzo(b)fluoranthene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Benzo(g,h,i)perylene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Benzo(k)fluoranthene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
bis(2-Chloroethoxy)methane	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
bis(2-Chloroethyl)ether	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
bis(2-Ethylhexyl)phthalate	37 J	320 U	330 U	31 J	360 U	330 U	180 U	210 U	190 U	200 U	32 J
Butylbenzylphthalate	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Caprolactam	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Carbazole	190 UJ	190 U	190 U	190 UJ	210 U	190 U	180 U	210 U	190 UJ	200 UJ	180 UJ
Chrysene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Dibenz(a,h)anthracene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Dibenzofuran	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Diethylphthalate	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Dimethyl phthalate	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Di-n-butylphthalate	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Di-n-octylphthalate	190 UJ	190 U	190 U	190 UJ	210 U	190 U	180 U	210 U	190 UJ	200 UJ	180 UJ
Fluoranthene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Fluorene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Hexachlorobenzene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Hexachlorobutadiene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Hexachlorocyclopentadiene	190 UJ	190 U	190 U	190 UJ	210 U	190 U	180 U	210 U	190 UJ	200 UJ	180 UJ
Hexachloroethane	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Indeno(1,2,3-cd)pyrene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Isophorone	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Naphthalene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
n-Nitroso-di-n-propylamine	38 UJ	37 U	38 U	37 UJ	42 U	38 U	36 U	41 U	38 UJ	39 UJ	36 UJ
n-Nitrosodiphenylamine	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Nitrobenzene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Pentachlorophenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Phenanthrene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Phenol	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Pyrene	190 U	190 U	190 U	190 U	210 U	190 U	180 U	210 U	190 U	200 U	180 U
Pesticide/Polychlorinated Biphenyls (µg/kg)											
4,4'-DDD	1.9 U	0.61 J	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	0.58 J	0.61 J	13	46
4,4'-DDE	1.9 U	9.7 J	0.54 J	1.9 U	1.6 J	0.56 J	1.8 U	0.68 J	0.92 J	6.8	95
4,4'-DDT	1.9 U	3.9 J	1.9 UJ	1.9 U	0.92 J	1 J	1.8 U	2.1 U	1.9 U	25	180
Aldrin	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
alpha-BHC	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
alpha-Chlordane	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	3.7 J	9.9 J
Aroclor-1016	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1221	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1232	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1242	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1248	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1254	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
Aroclor-1260	19 U	19 U	19 U	19 U	21 U	19 U	18 U	21 U	19 U	20 U	18 UJ
beta-BHC	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
delta-BHC	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Dieldrin	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	2.3	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endosulfan I	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endosulfan II	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endosulfan sulfate	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endrin	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endrin aldehyde	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Endrin ketone	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
gamma-BHC (Lindane)	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
gamma-Chlordane	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	3.2	7.4
Heptachlor	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Heptachlor epoxide	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Methoxychlor	1.9 U	1.9 U	1.9 U	1.9 U	2.1 U	1.9 U	1.8 U	2.1 U	1.9 U	2 U	1.8 U
Toxaphene	38 U	37 U	38 U	37 U	42 U	38 U	36 U	41 U	38 U	39 U	36 U
Total Metals (mg/kg)											
Aluminum	3,380	6,070 J	5,570 J	3,310	4,940	4,190 J	1,590	2,650	455	5,090	3,550
Antimony	0.82 J-	1.6 UJ	1.6 UJ	1.6 UJ	1.8 UJ	1.6 UJ	1.5 UJ	1.7 UJ	1.6 UJ	8.6 UJ	0.21 J-
Arsenic	1.8	1.6	1.8	1.2 J	1.9	0.38 J	0.63 J	1.9	1.6 U	16.6	1.4 J
Barium	32.3	13.6	12	5.4	14.8 J	6.8	3.6 J	8.8 J	4.1 U	21.5 U	8.5
Beryllium	0.042 J	0.16 U	0.16 U	0.04 J	0.18 U	0.16 U	0.15 U	0.17 U	0.16 U	0.071 J	0.056 J
Cadmium	0.53	0.47 U	0.47 U	0.47 U	0.54 U	0.49 U	0.46 U	0.52 U	0.49 U	0.82 J	0.019 J
Calcium	20,000	518	470	156	670	425	76.9 U	283	82.1 U	2,630	137
Chromium	6.9 J	6.3	5.5	4.7 J	7.4	6.1	6.3	3.1	1.1 J	52.4 J	5.7 J
Cobalt	0.73	0.32 J	0.22 J	0.16 J	0.39 J	0.22 J	0.066 J	0.099 J	0.41 U	9.3	0.14 J
Copper	27.5	5.9	4.6	0.71 J	31.7	1.6 U	0.89 J	2.1	0.27 J	10.6	2.6



CTO-11  
Camp Lejeune - Site 15  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	IR15-SB01	IR15-SB02		IR15-SB03	IR15-SB04	IR15-SB05	IR15-SB06	IR15-SB07	IR15-SB08	IR15-SB09	IR15-SB10
Sample ID	IR15-SB01-4-6-09C	IR15-SB02-2-7-09C	IR15-SB02D-2-7-09C	IR15-SB03-2-7-09C	IR15-SB04-2-7-09C	IR15-SB05-2-7-09C	IR15-SB06-2-7-09C	IR15-SB07-2-4-09C	IR15-SB08-2-4-09C	IR15-SB09-2-7-09C	IR15-SB10-2-4-09C
Sample Date	07/29/09	07/26/09	07/26/09	07/29/09	07/27/09	07/27/09	07/27/09	07/27/09	07/29/09	07/29/09	07/29/09
Chemical Name											
Iron	5,830	4,050	2,640	2,540	3,470	2,260	718	1,290	153 J+	179,000 J+	3,020
Lead	483	28.4	21.6	2.9	53	4.6	2.7	5.7	1.3 J	111	5.8
Magnesium	219	174	178	130	206	180	58	89.6	17.2 J	200	105
Manganese	69.6	9.2	9.2	6.8	21.9 J+	5.9	5.6 J+	8 J+	1.5	626	6.9
Mercury	0.14	0.036	0.013 J	0.033 U	0.036 J	0.035 U	0.0027 J	0.032 J	0.033 U	0.037 U	0.045
Nickel	3.9	1.7	1.5	0.79 U	1.5 J	0.88	0.74 J	0.74 J	0.82 U	24.4	1
Potassium	143	121	137	144	199	166	54.4 J	64.3 J	18.2 J	236 J	102
Selenium	1.6 U	1.6 U	1.6 U	1.6 U	1.8 U	1.6 U	1.5 U	1.7 U	1.6 U	8.6 U	1.6 U
Silver	1.6 U	1.6 U	1.6 U	1.6 U	1.8 U	1.6 U	1.5 U	1.7 U	1.6 U	8.6 U	1.6 U
Sodium	202 U	8.8 J	7.7 J	5.6 J	15 J	7.2 J	4.3 J	8.2 J	205 U	1,080 U	194 U
Thallium	2.4 U	2.3 U	2.4 U	2.4 U	2.7 U	2.5 U	2.3 U	2.6 U	2.5 U	1.9 J	2.3 U
Vanadium	7	10.4 J+	7.3 J+	6	8.9 J	8.8 J+	2.3 J	3.4 J	4.1 U	21.5 U	7.1
Zinc	345	19.5	17.1	3.9 U	34.3	4.1 U	1.5 J	4.1 J	4.1 U	99	8 U
Wet Chemistry											
pH (ph)	7.5	6.9	7.3	5.1	7.4	5.9	5.4	6	6.8	7.5	5

Notes:

Shading indicates detections

NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units  
µg/kg - Micrograms per kilogram



CTO-11  
Camp Lejeune - Site 15  
Validated Groundwater Raw Analytical Results  
July 2009

Station ID	IR15-TW01	IR15-TW02	IR15-TW03		IR15-TW04	IR15-TW05
Sample ID	IR15-TW01-09C	IR15-TW02-09C	IR15-TW03-09C	IR15-TW03D-09C	IR15-TW04-09C	IR15-TW05-09C
Sample Date	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09
Chemical Name						
<b>Volatile Organic Compounds (µg/l)</b>						
1,1,1-Trichloroethane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,1,2,2-Tetrachloroethane	1 U	1 U	2.4 UJ	2.4 R	1 U	2.4 R
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1 U	1 U	1 UJ	1 R	1 U	1 R
1,1,2-Trichloroethane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,1-Dichloroethane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,1-Dichloroethene	1 U	1 U	1 UJ	1 R	1 U	1 R
1,2,4-Trichlorobenzene	1 U	1 U	1 UJ	1 R	1 U	1 R
1,2-Dibromo-3-chloropropane	2 R	2 R	2 R	2 R	2 R	2 R
1,2-Dibromoethane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,2-Dichlorobenzene	1 U	1 U	1 UJ	1 R	1 U	1 R
1,2-Dichloroethane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,2-Dichloropropane	1 U	1 U	1 UJ	1 R	1 U	1 R
1,3-Dichlorobenzene	1 U	1 U	1 UJ	1 R	1 U	1 R
1,4-Dichlorobenzene	1 U	1 U	1 UJ	1 R	1 U	1 R
2-Butanone	5 U	5 U	5 UJ	5 R	5 U	5 R
2-Hexanone	5 U	5 U	5 UJ	5 R	5 U	5 R
4-Methyl-2-pentanone	5 U	5 U	5 UJ	5 R	5 U	5 R
Acetone	5 U	5 U	5 UJ	5 R	5 U	5 R
Benzene	1 U	1 U	1 UJ	1 R	1 U	1 R
Bromodichloromethane	1 U	1 U	1 UJ	1 R	1 U	1 R
Bromoform	1 U	1 U	1 UJ	1 R	1 U	1 R
Bromomethane	1.1 U	1.1 U	1.1 UJ	1.1 R	1.1 U	1.1 R
Carbon disulfide	1 U	1 U	1 UJ	1 R	1 U	1 R
Carbon tetrachloride	1 U	1 U	1 UJ	1 R	1 U	1 R
Chlorobenzene	1 U	1 U	1 UJ	1 R	1 U	1 R
Chloroethane	1 UJ	1 UJ	1 UJ	1 R	1 UJ	1 R
Chloroform	1 U	1 U	1 UJ	1 R	1 U	1 R
Chloromethane	1 UJ	1 UJ	1 UJ	1 R	1 UJ	1 R
cis-1,2-Dichloroethene	1 U	1 U	1 UJ	1 R	1 U	1 R
cis-1,3-Dichloropropene	1 U	1 U	1 UJ	1 R	1 U	1 R
Cyclohexane	1 U	1 U	1 UJ	1 R	1 U	1 R
Dibromochloromethane	1 U	1 U	1 UJ	1 R	1 U	1 R
Dichlorodifluoromethane (Freon-12)	1 UJ	1 UJ	1 UJ	1 R	1 UJ	1 R
Ethylbenzene	1 U	1 U	1 UJ	1 R	1 U	2.3 R
Isopropylbenzene	1 U	1 U	1 UJ	4.9 J	1 U	1 R
Methyl acetate	1 U	1 U	1 UJ	1 R	1 U	1 R
Methylcyclohexane	1 U	1 U	1 UJ	1 R	1 U	1 R
Methylene chloride	1 U	1 U	1 UJ	1 R	1 U	1 R
Methyl-tert-butyl ether (MTBE)	1 U	1 U	1 UJ	1 R	1 U	1 R
Styrene	1 U	1 U	1 UJ	5.9 J	1 U	1 R
Tetrachloroethene	1.1 U	1.1 U	1.1 UJ	1.1 R	1.1 U	1.1 R
Toluene	1 U	1 U	1 UJ	1 R	1 U	1 R
trans-1,2-Dichloroethene	1 U	1 U	1 UJ	1 R	1 U	1 R
trans-1,3-Dichloropropene	1 U	1 U	1 UJ	1 R	1 U	1 R
Trichloroethene	5.1 U	5.1 U	5.1 UJ	5.1 R	5.1 U	5.1 R
Trichlorofluoromethane(Freon-11)	1 UJ	1 UJ	1 UJ	1 R	1 UJ	1 R
Vinyl chloride	1 U	1 U	1 UJ	1 R	1 U	1 R
Xylene, total	1.2 U	1.2 U	1.2 UJ	1.2 R	1.2 U	1.2 R
<b>Semivolatile Organic Compounds (µg/l)</b>						
1,1-Biphenyl	11 U	10 U	NA	NA	11 U	NA
2,2'-Oxybis(1-chloropropane)	11 U	10 U	NA	NA	11 U	NA
2,4,5-Trichlorophenol	11 U	10 U	NA	NA	11 U	NA
2,4-Dichlorophenol	11 U	10 U	NA	NA	11 U	NA
2,4-Dimethylphenol	11 U	10 U	NA	NA	11 U	NA
2,4-Dinitrophenol	21 U	20 U	NA	NA	22 U	NA
2,4-Dinitrotoluene	11 U	10 U	NA	NA	11 U	NA
2,6-Dinitrotoluene	11 U	10 U	NA	NA	11 U	NA
2-Chloronaphthalene	11 U	10 U	NA	NA	11 U	NA
2-Chlorophenol	11 U	10 U	NA	NA	11 U	NA
2-Methylnaphthalene	11 U	10 U	NA	NA	11 U	NA
2-Methylphenol	11 UJ	10 UJ	NA	NA	11 UJ	NA
2-Nitroaniline	11 U	10 U	NA	NA	11 U	NA
2-Nitrophenol	11 U	10 U	NA	NA	11 U	NA
3,3'-Dichlorobenzidine	21 UJ	20 UJ	NA	NA	22 UJ	NA
3-Nitroaniline	11 U	10 U	NA	NA	11 U	NA
4,6-Dinitro-2-methylphenol	21 U	20 U	NA	NA	22 U	NA
4-Bromophenyl-phenylether	11 U	10 U	NA	NA	11 U	NA
4-Chloro-3-methylphenol	11 U	10 U	NA	NA	11 U	NA
4-Chloroaniline	11 U	10 U	NA	NA	11 U	NA
4-Chlorophenyl-phenylether	11 U	10 U	NA	NA	11 U	NA
4-Methylphenol	21 U	20 U	NA	NA	22 U	NA
4-Nitroaniline	11 U	10 U	NA	NA	11 U	NA
4-Nitrophenol	21 U	20 U	NA	NA	22 U	NA
Acenaphthene	11 U	10 U	NA	NA	11 U	NA
Acenaphthylene	11 U	10 U	NA	NA	11 U	NA
Acetophenone	11 U	10 U	NA	NA	11 U	NA



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Camp Lejeune - Site 15  
Validated Groundwater Raw Analytical Results  
July 2009

Station ID	IR15-TW01	IR15-TW02	IR15-TW03		IR15-TW04	IR15-TW05
Sample ID	IR15-TW01-09C	IR15-TW02-09C	IR15-TW03-09C	IR15-TW03D-09C	IR15-TW04-09C	IR15-TW05-09C
Sample Date	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09
Chemical Name						
Anthracene	11 U	10 U	NA	NA	11 U	NA
Atrazine	21 U	20 U	NA	NA	22 U	NA
Benzaldehyde	11 R	10 R	NA	NA	11 R	NA
Benzo(a)anthracene	11 U	10 U	NA	NA	11 U	NA
Benzo(a)pyrene	11 U	10 U	NA	NA	11 U	NA
Benzo(b)fluoranthene	11 U	10 U	NA	NA	11 U	NA
Benzo(g,h,i)perylene	11 U	10 U	NA	NA	11 U	NA
Benzo(k)fluoranthene	11 U	10 U	NA	NA	11 U	NA
bis(2-Chloroethoxy)methane	11 U	10 U	NA	NA	11 U	NA
bis(2-Chloroethyl)ether	11 U	10 U	NA	NA	11 U	NA
bis(2-Ethylhexyl)phthalate	11 U	10 U	NA	NA	11 U	NA
Butylbenzylphthalate	11 U	10 U	NA	NA	11 U	NA
Caprolactam	11 U	10 U	NA	NA	11 U	NA
Carbazole	11 U	10 U	NA	NA	11 U	NA
Chrysene	11 U	10 U	NA	NA	11 U	NA
Dibenz(a,h)anthracene	11 U	10 U	NA	NA	11 U	NA
Dibenzofuran	11 U	10 U	NA	NA	11 U	NA
Diethylphthalate	11 U	10 U	NA	NA	11 U	NA
Dimethyl phthalate	11 U	10 U	NA	NA	11 U	NA
Di-n-butylphthalate	21 U	20 U	NA	NA	22 U	NA
Di-n-octylphthalate	11 U	10 U	NA	NA	11 U	NA
Fluoranthene	11 U	10 U	NA	NA	11 U	NA
Fluorene	11 U	10 U	NA	NA	11 U	NA
Hexachlorobenzene	11 U	10 U	NA	NA	11 U	NA
Hexachlorobutadiene	11 U	10 U	NA	NA	11 U	NA
Hexachlorocyclopentadiene	11 U	10 U	NA	NA	11 U	NA
Hexachloroethane	11 U	10 U	NA	NA	11 U	NA
Indeno(1,2,3-cd)pyrene	11 U	10 U	NA	NA	11 U	NA
Isophorone	11 U	10 U	NA	NA	11 U	NA
Naphthalene	11 U	10 U	NA	NA	11 U	NA
n-Nitroso-di-n-propylamine	11 U	10 U	NA	NA	11 U	NA
n-Nitrosodiphenylamine	11 U	10 U	NA	NA	11 U	NA
Nitrobenzene	11 U	10 U	NA	NA	11 U	NA
Pentachlorophenol	21 U	20 U	NA	NA	22 U	NA
Phenanthrene	11 U	10 U	NA	NA	11 U	NA
Phenol	11 U	10 U	NA	NA	11 U	NA
Pyrene	11 U	10 U	NA	NA	11 U	NA
<b>Pesticide/Polychlorinated Biphenyls (µg/l)</b>						
4,4'-DDD	0.051 U	0.052 U	NA	NA	0.053 U	NA
4,4'-DDE	0.051 U	0.052 U	NA	NA	0.053 U	NA
4,4'-DDT	0.051 U	0.052 U	NA	NA	0.053 U	NA
Aldrin	0.051 U	0.052 U	NA	NA	0.053 U	NA
alpha-BHC	0.051 U	0.052 U	NA	NA	0.053 U	NA
alpha-Chlordane	0.051 U	0.052 U	NA	NA	0.053 U	NA
Aroclor-1016	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1221	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1232	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1242	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1248	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1254	0.51 U	0.52 U	NA	NA	0.53 U	NA
Aroclor-1260	0.51 U	0.52 U	NA	NA	0.53 U	NA
beta-BHC	0.051 U	0.052 U	NA	NA	0.053 U	NA
delta-BHC	0.051 U	0.052 U	NA	NA	0.053 U	NA
Dieldrin	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endosulfan I	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endosulfan II	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endosulfan sulfate	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endrin	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endrin aldehyde	0.051 U	0.052 U	NA	NA	0.053 U	NA
Endrin ketone	0.051 U	0.052 U	NA	NA	0.053 U	NA
gamma-BHC (Lindane)	0.051 U	0.052 U	NA	NA	0.053 U	NA
gamma-Chlordane	0.051 U	0.052 U	NA	NA	0.053 U	NA
Heptachlor	0.051 U	0.052 U	NA	NA	0.053 U	NA
Heptachlor epoxide	0.051 U	0.052 U	NA	NA	0.053 U	NA
Methoxychlor	0.051 U	0.052 U	NA	NA	0.053 U	NA
Toxaphene	1 U	1 U	NA	NA	1.1 U	NA
<b>Total Metals (µg/l)</b>						
Aluminum	45.8 J	148 J	612 J	1,000 U	307 J	3,360
Antimony	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	20 U	20 U	20 U	20 U	3.2 J	20 U
Barium	28 J	24.3 J	92.1	95	24.1 J	19.2 J
Beryllium	2 U	2 U	0.17 J	0.18 J	2 U	2 U
Cadmium	6 U	6 U	6 U	6 U	6 U	6 U
Calcium	27,500	4,110	3,580	3,540	45,500	42,500
Chromium	20 U	20 U	20 U	1.7 J	20 U	5 J
Cobalt	3.9 J	0.63 J	1 J	2.6 J	0.66 J	5 U
Copper	20 U	2.8 J	20 U	2.9 J	20 U	3.8 J



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Camp Lejeune - Site 15  
Validated Groundwater Raw Analytical Results  
July 2009

Station ID	IR15-TW01	IR15-TW02	IR15-TW03		IR15-TW04	IR15-TW05
Sample ID	IR15-TW01-09C	IR15-TW02-09C	IR15-TW03-09C	IR15-TW03D-09C	IR15-TW04-09C	IR15-TW05-09C
Sample Date	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09
Chemical Name						
Iron	25,800	2,910	6,450	6,440	10,600	1,040
Lead	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium	1,410	393	4,520	4,620	2,940	1,040
Manganese	439	49.6	87	89.6	149	5.2
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	30	21.2	10.1	12.1	10 U	2.3 J
Potassium	1,330	2,540	1,480	1,550	808 J	624 J
Selenium	20 U	20 U	20 U	20 U	20 U	20 U
Silver	20 U	20 U	20 U	20 U	20 U	20 U
Sodium	1,590 J	5,120	7,670	8,000	2,910	4,510
Thallium	30 U	30 U	30 U	30 U	3.2 J	30 U
Vanadium	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	5.3 J	5.5 J	10.9 J	7.8 J	9.2 J	7.1 J
Dissolved Metals (µg/l)						
Aluminum, Dissolved	1,000 U	40 J	516 J	629 J	1,000 U	1,000 U
Antimony, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Barium, Dissolved	25.6 J	21.8 J	94	96.8	23.2 J	20 U
Beryllium, Dissolved	2 U	0.089 J	0.21 J	0.2 J	2 U	2 U
Cadmium, Dissolved	6 U	6 U	6 U	6 U	6 U	6 U
Calcium, Dissolved	25,000	3,980	3,550	3,710	44,100	42,900
Chromium, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Cobalt, Dissolved	3.1 J	0.54 J	1.1 J	1.1 J	0.66 J	5 U
Copper, Dissolved	2.7 J	4.6 J	2.7 J	20 U	20 U	20 U
Iron, Dissolved	20,500	2,570	6,620	6,720	7,240	102 J
Lead, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium, Dissolved	1,350	370	4,580	4,740	2,840	912
Manganese, Dissolved	236	45.7	90.2	88.8	165	2.8 J
Mercury, Dissolved	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Dissolved	25	23	10.2	10.4	10 U	10 U
Potassium, Dissolved	1,110	2,460	1,560	1,600	780 J	472 J
Selenium, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Silver, Dissolved	20 U	20 U	20 U	20 U	20 U	20 U
Sodium, Dissolved	1,580 J	5,010	7,910	8,120	2,900	4,290
Thallium, Dissolved	30 U	30 U	30 U	30 U	30 U	30 U
Vanadium, Dissolved	50 U	50 U	50 U	50 U	50 U	50 U
Zinc, Dissolved	50 U	9.9 J	7.6 J	12.1 J	50 U	50 U
Wet Chemistry						
pH (ph)	NA	NA	NA	NA	NA	6.4

**Notes:**

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

ph - pH units

µg/l - Micrograms per liter



Station ID	IR17-SS01		IR17-SS02	IR17-SS03	IR17-SS04	IR17-SS05
Sample ID	IR17-SS01-00-01-09C	IR17-SS01D-00-01-09C	IR17-SS02-00-01-09C	IR17-SS03-00-01-09C	IR17-SS04-00-01-09C	IR17-SS05-00-01-09C
Sample Date	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name						
<b>Volatile Organic Compounds (µg/kg)</b>						
1,1,1-Trichloroethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,1,2,2-Tetrachloroethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,1,2-Trichloroethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,1-Dichloroethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,1-Dichloroethene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2,4-Trichlorobenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2-Dibromo-3-chloropropane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2-Dibromoethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2-Dichlorobenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2-Dichloroethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,2-Dichloropropane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,3-Dichlorobenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
1,4-Dichlorobenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
2-Butanone	14 J	4.9 J	5.1 J	11 UJ	23 J	2.8 J
2-Hexanone	13 UJ	6.1 UJ	9.2 UJ	11 UJ	10 R	9.7 UJ
4-Methyl-2-pentanone	13 UJ	6.1 UJ	9.2 UJ	11 UJ	10 R	9.7 UJ
Acetone	680 J	200 J	70 J	11 UJ	900 J	72 J
Benzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Bromodichloromethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Bromoform	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Bromomethane	13 R	6.1 R	9.2 UJ	11 UJ	10 R	9.7 UJ
Carbon disulfide	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Carbon tetrachloride	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Chlorobenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Chloroethane	13 UJ	6.1 UJ	9.2 UJ	11 UJ	10 R	9.7 UJ
Chloroform	6.5 UJ	3 UJ	13 J	5.4 UJ	5.2 R	4.8 UJ
Chloromethane	6.5 J	2.8 J	9.2 UJ	11 UJ	10 R	9.7 UJ
cis-1,2-Dichloroethene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
cis-1,3-Dichloropropene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Cyclohexane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Dibromochloromethane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Dichlorodifluoromethane (Freon-12)	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Ethylbenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Isopropylbenzene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Methyl acetate	6.5 UJ	3 UJ	4.3 J	3.6 J	70 J	7 J
Methylcyclohexane	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Methylene chloride	13 UJ	6.1 UJ	9.2 UJ	11 UJ	10 R	9.7 UJ
Methyl-tert-butyl ether (MTBE)	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Styrene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Tetrachloroethene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Toluene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
trans-1,2-Dichloroethene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
trans-1,3-Dichloropropene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Trichloroethene	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Trichlorofluoromethane (Freon-11)	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
Vinyl chloride	13 UJ	6.1 UJ	9.2 UJ	11 UJ	10 R	9.7 UJ
Xylene, total	6.5 UJ	3 UJ	4.6 UJ	5.4 UJ	5.2 R	4.8 UJ
<b>Semivolatile Organic Compounds (µg/kg)</b>						
1,1-Biphenyl	240 U	240 U	180 U	180 U	180 U	180 U
2,2-Oxybis(1-chloropropane)	240 U	240 U	180 U	180 U	180 U	180 U
2,4,5-Trichlorophenol	240 U	240 U	180 U	180 U	180 U	180 U
2,4-Dichlorophenol	240 U	240 U	180 U	180 U	180 U	180 U
2,4-Dimethylphenol	240 U	240 U	180 U	180 U	180 U	180 U
2,4-Dinitrophenol	240 U	240 U	180 U	180 U	180 U	180 U
2,4-Dinitrotoluene	240 U	240 U	180 U	180 U	180 U	180 U
2,6-Dinitrotoluene	240 U	240 U	180 U	180 U	180 U	180 U
2-Chloronaphthalene	240 U	240 U	180 U	180 U	180 U	180 U
2-Chlorophenol	240 U	240 U	180 U	180 U	180 U	180 U
2-Methylnaphthalene	240 U	240 U	180 U	180 U	180 U	180 U
2-Methylphenol	240 U	240 U	180 U	180 U	180 U	180 U
2-Nitroaniline	240 U	240 U	180 U	180 U	180 U	180 U
2-Nitrophenol	240 U	240 U	180 U	180 U	180 U	180 U
3,3'-Dichlorobenzidine	240 UJ	240 UJ	180 U	180 U	180 U	180 U
3-Nitroaniline	240 U	240 U	180 U	180 U	180 U	180 U
4,6-Dinitro-2-methylphenol	240 U	240 U	180 U	180 U	180 U	180 U
4-Bromophenyl-phenylether	240 U	240 U	180 U	180 U	180 U	180 U
4-Chloro-3-methylphenol	240 U	240 U	180 U	180 U	180 U	180 U
4-Chloroaniline	240 U	240 U	180 U	180 U	180 U	180 U
4-Chlorophenyl-phenylether	240 U	240 U	180 U	180 U	180 U	180 U
4-Methylphenol	240 U	240 U	180 U	180 U	180 U	180 U
4-Nitroaniline	240 U	240 U	180 U	180 U	180 U	180 U
4-Nitrophenol	240 U	240 U	180 U	180 U	180 U	180 U
Acenaphthene	240 U	240 U	180 U	180 U	180 U	180 U
Acenaphthylene	240 U	240 U	180 U	180 U	180 U	180 U
Acetophenone	240 U	240 U	180 U	180 U	180 U	180 U
Anthracene	240 U	240 U	180 U	180 U	180 U	180 U
Atrazine	240 U	240 U	180 U	180 U	180 U	180 U
Benzaldehyde	240 U	240 U	180 U	180 U	180 U	180 U
Benzo(a)anthracene	49 U	47 U	36 U	36 U	35 U	35 U
Benzo(a)pyrene	49 U	47 U	36 U	36 U	35 U	35 U
Benzo(b)fluoranthene	49 U	47 U	36 U	36 U	35 U	35 U
Benzo(g,h,i)perylene	240 U	240 U	180 U	180 U	180 U	180 U
Benzo(k)fluoranthene	240 U	240 U	180 U	180 U	180 U	180 U
bis(2-Chloroethoxy)methane	240 U	240 U	180 U	180 U	180 U	180 U
bis(2-Chloroethyl)ether	240 U	240 U	180 U	180 U	180 U	180 U
bis(2-Ethylhexyl)phthalate	96 J	240 U	180 U	180 U	180 U	180 U
Butylbenzylphthalate	240 U	240 U	180 U	180 U	180 U	180 U
Caprolactam	240 U	240 U	180 U	180 U	180 U	180 U
Carbazole	240 U	240 U	180 U	180 U	180 U	180 U
Chrysene	240 U	240 U	180 U	180 U	180 U	180 U
Dibenz(a,h)anthracene	49 U	47 U	36 U	36 U	35 U	35 U



Station ID	IR17-SS01		IR17-SS02	IR17-SS03	IR17-SS04	IR17-SS05
Sample ID	IR17-SS01-00-01-09C	IR17-SS01D-00-01-09C	IR17-SS02-00-01-09C	IR17-SS03-00-01-09C	IR17-SS04-00-01-09C	IR17-SS05-00-01-09C
Sample Date	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name						
Dibenzofuran	240 U	240 U	180 U	180 U	180 U	180 U
Diethylphthalate	240 U	240 U	180 U	180 U	180 U	180 U
Dimethyl phthalate	240 U	240 U	180 U	180 U	180 U	180 U
Di-n-butylphthalate	93 J	240 U	180 U	180 U	180 U	180 U
Di-n-octylphthalate	240 UJ	240 UJ	180 U	180 U	180 U	180 U
Fluoranthene	240 U	240 U	180 U	180 U	180 U	180 U
Fluorene	240 U	240 U	180 U	180 U	180 U	180 U
Hexachlorobenzene	240 U	240 U	180 U	180 U	180 U	180 U
Hexachlorobutadiene	240 U	240 U	180 U	180 U	180 U	180 U
Hexachlorocyclopentadiene	240 U	240 U	180 U	180 U	180 U	180 U
Hexachloroethane	240 U	240 U	180 U	180 U	180 U	180 U
Indeno(1,2,3-cd)pyrene	49 U	47 U	36 U	36 U	35 U	35 U
Isophorone	49 U	47 U	36 U	36 U	35 U	35 U
Naphthalene	240 U	240 U	180 U	180 U	180 U	180 U
n-Nitroso-di-n-propylamine	49 U	47 U	36 U	36 U	35 U	35 U
n-Nitrosodiphenylamine	240 U	240 U	180 U	180 U	180 U	180 U
Nitrobenzene	240 U	240 U	180 U	180 U	180 U	180 U
Pentachlorophenol	240 U	240 U	180 U	180 U	180 U	180 U
Phenanthrene	240 U	240 U	180 U	180 U	180 U	180 U
Phenol	240 U	240 U	180 U	180 U	180 U	180 U
Pyrene	240 U	240 U	180 UJ	180 U	180 UJ	180 U
Pesticide/Polychlorinated Biphenyls (µg/kg)						
4,4'-DDD	2.5 U	2.4 U	1.8 U	1.8 U	1.8 U	1.7 U
4,4'-DDE	0.63 J	0.6 J	1.1 J	1.8 UJ	0.83 J	2.2 J
4,4'-DDT	2.5 UJ	2.4 UJ	1.9 J	1.8 UJ	1 J	0.9 J
Aldrin	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
alpha-BHC	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
alpha-Chlordane	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Aroclor-1016	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1221	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1232	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1242	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1248	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1254	24 U	24 U	17 U	17 U	17 U	17 U
Aroclor-1260	24 U	24 U	17 U	17 U	17 U	17 U
beta-BHC	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
delta-BHC	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Dieldrin	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endosulfan I	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endosulfan II	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endosulfan sulfate	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endrin	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endrin aldehyde	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Endrin ketone	2.5 UJ	2.4 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
gamma-BHC (Lindane)	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
gamma-Chlordane	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Heptachlor	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Heptachlor epoxide	2.5 U	2.4 U	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Methoxychlor	2.5 UJ	2.4 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.7 UJ
Toxaphene	49 U	48 U	36 UJ	36 UJ	35 UJ	35 UJ
Total Metals (mg/kg)						
Aluminum	7,580 J+	7,110 J+	7,320	5,150	5,810	5,520
Antimony	2.1 U	2 U	1.5 UJ	1.5 UJ	1.5 UJ	1.5 UJ
Arsenic	4.9	3.3	1.3 J	1.9	1.8	1.1 J
Barium	16.1	19.2	21.3	12.7	14.8	14.9
Beryllium	0.21 U	0.2 U	0.16	0.15 U	0.14 J	0.14 J
Cadmium	0.64 U	0.61 U	0.02 J	0.45 U	0.44 U	0.46 U
Calcium	356	372	91.5	210	92.5	181
Chromium	8.3	7.5	3.8	3.7	3.3	2.7
Cobalt	0.54 U	0.51 U	0.29 J	0.21 J	0.33 J	0.31 J
Copper	1 J	0.95 J	0.92 J	0.7 J	0.81 J	0.93 J
Iron	7,640	5,230	2,190	1,800	1,670	1,880
Lead	17.1	13.9	7.5	9.3	8.7	9.3
Magnesium	667	646	221	178	186	132
Manganese	9.1	8.2	9.3	8.7	10.8	5.9
Mercury	0.052	0.045 U	0.033 U	0.042	0.033 U	0.033 U
Nickel	1.5	1.2	2	1.4	1.5	1.4
Potassium	495	461	134	119	116	113
Selenium	0.69 J	0.57 J	1.5 U	1.5 U	1.5 U	1.5 U
Silver	0.4 J	0.16 J	1.5 U	1.5 U	1.5 U	1.5 U
Sodium	1,840	1,870	30.8 J	188 U	13.5 J	13.1 J
Thallium	3.2 U	3 U	2.3 U	2.3 U	2.2 U	2.3 U
Vanadium	20.8	15.9	6.8	6.2	6.2	5.8
Zinc	5.4 U	5.1 U	5.2	4.3	4.3	5.2
Wet Chemistry						
pH (ph)	4.2	4.2	4.7	4.6	4.9	4.3

Notes:

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

J+ - Analyte present, value may be biased high, actual value may be lower

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram



CTO-11  
Camp Lejeune - Site 17  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	IR17-SB01	IR17-SB02	IR17-SB03		IR17-SB04	IR17-SB05
Sample ID	IR17-SB01-2-4-09C	IR17-SB02-2-7-09C	IR17-SB03-2-7-09C	IR17-SB03D-2-7-09C	IR17-SB04-2-7-09C	IR17-SB05-2-7-09C
Sample Date	07/27/09	07/28/09	07/28/09	07/28/09	07/28/09	07/28/09
<b>Chemical Name</b>						
<b>Volatile Organic Compounds (µg/kg)</b>						
1,1,1-Trichloroethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,1,2,2-Tetrachloroethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,1,2-Trichloroethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,1-Dichloroethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,1-Dichloroethene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,2,4-Trichlorobenzene	1.1 J	1.4 U	2 UJ	1.8 R	1.7 UJ	1.8 UJ
1,2-Dibromo-3-chloropropane	1.6 J	1.4 U	2 UJ	1.8 R	1.7 UJ	1.8 UJ
1,2-Dibromoethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,2-Dichlorobenzene	2.2 UJ	1.4 U	2 UJ	1.8 R	1.7 UJ	1.8 UJ
1,2-Dichloroethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,2-Dichloropropane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,3-Dichlorobenzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
1,4-Dichlorobenzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
2-Butanone	1.4 J	2.9 U	2.6 J	1.3 J	3.3 UJ	3.5 UJ
2-Hexanone	4.4 UJ	2.9 U	3.9 UJ	3.5 UJ	3.3 UJ	3.5 UJ
4-Methyl-2-pentanone	4.4 UJ	2.9 U	3.9 UJ	3.5 UJ	3.3 UJ	3.5 UJ
Acetone	70 J	2.9 U	99 J	41 J	3.3 UJ	3.5 UJ
Benzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Bromodichloromethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Bromoform	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Bromomethane	4.4 UJ	2.9 UJ	3.9 UJ	3.5 UJ	3.3 UJ	3.5 UJ
Carbon disulfide	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Carbon tetrachloride	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Chlorobenzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Chloroethane	4.4 UJ	2.9 U	3.9 UJ	3.5 UJ	3.3 UJ	3.5 UJ
Chloroform	4.9 J	2.3	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Chloromethane	4.4 UJ	2.9 U	3.9 UJ	3.5 UJ	3.3 UJ	3.5 UJ
cis-1,2-Dichloroethene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
cis-1,3-Dichloropropene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Cyclohexane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Dibromochloromethane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Dichlorodifluoromethane (Freon-12)	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Ethylbenzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Isopropylbenzene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Methyl acetate	1.3 J	1.4 U	96 J	13 J	5.1 J	1.3 J
Methylcyclohexane	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Methylene chloride	2.2 UJ	1.4 U	1.5 J	1.8 UJ	3.3 UJ	1.8 UJ
Methyl-tert-butyl ether (MTBE)	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Styrene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Tetrachloroethene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Toluene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
trans-1,2-Dichloroethene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
trans-1,3-Dichloropropene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Trichloroethene	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Trichlorofluoromethane(Freon-11)	2.2 UJ	1.4 U	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
Vinyl chloride	4.4 R	2.9 UJ	3.9 R	3.5 UJ	3.3 UJ	3.5 UJ
Xylene, total	2.2 UJ	1.4 UJ	2 UJ	1.8 UJ	1.7 UJ	1.8 UJ
<b>Semivolatile Organic Compounds (µg/kg)</b>						
1,1-Biphenyl	210 U	200 U	210 U	220 U	190 U	190 U
2,2'-Oxybis(1-chloropropane)	210 U	200 U	210 U	220 U	190 U	190 U
2,4,5-Trichlorophenol	210 U	200 U	210 U	220 U	190 U	190 U
2,4-Dichlorophenol	210 U	200 U	210 U	220 U	190 U	190 U
2,4-Dimethylphenol	210 U	200 U	210 U	220 U	190 U	190 U
2,4-Dinitrophenol	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
2,4-Dinitrotoluene	210 U	200 U	210 U	220 U	190 U	190 U
2,6-Dinitrotoluene	210 U	200 U	210 U	220 U	190 U	190 U
2-Chloronaphthalene	210 U	200 U	210 U	220 U	190 U	190 U
2-Chlorophenol	210 U	200 U	210 U	220 U	190 U	190 U
2-Methylnaphthalene	210 U	200 U	210 U	220 U	190 U	190 U
2-Methylphenol	210 U	200 U	210 U	220 U	190 U	190 U
2-Nitroaniline	210 U	200 U	210 U	220 U	190 U	190 U
2-Nitrophenol	210 U	200 U	210 U	220 U	190 U	190 U
3,3'-Dichlorobenzidine	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
3-Nitroaniline	210 U	200 U	210 U	220 U	190 U	190 U
4,6-Dinitro-2-methylphenol	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
4-Bromophenyl-phenylether	210 U	200 U	210 U	220 U	190 U	190 U
4-Chloro-3-methylphenol	210 U	200 U	210 U	220 U	190 U	190 U
4-Chloroaniline	210 U	200 U	210 U	220 U	190 U	190 U
4-Chlorophenyl-phenylether	210 U	200 U	210 U	220 U	190 U	190 U
4-Methylphenol	210 U	200 U	210 U	220 U	190 U	190 U
4-Nitroaniline	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
4-Nitrophenol	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
Acenaphthene	210 U	200 U	210 U	220 U	190 U	190 U
Acenaphthylene	210 U	200 U	210 U	220 U	190 U	190 U
Acetophenone	210 U	200 U	210 U	220 U	190 U	190 U



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Station ID	IR17-SB01	IR17-SB02	IR17-SB03		IR17-SB04	IR17-SB05
Sample ID	IR17-SB01-2-4-09C	IR17-SB02-2-7-09C	IR17-SB03-2-7-09C	IR17-SB03D-2-7-09C	IR17-SB04-2-7-09C	IR17-SB05-2-7-09C
Sample Date	07/27/09	07/28/09	07/28/09	07/28/09	07/28/09	07/28/09
Chemical Name						
Anthracene	210 U	200 U	210 U	220 U	190 U	190 U
Atrazine	210 UJ	200 UJ	210 UJ	220 UJ	190 UJ	190 UJ
Benzaldehyde	210 R	200 R	210 R	220 R	190 R	190 R
Benzo(a)anthracene	42 U	40 U	43 U	44 U	37 U	38 U
Benzo(a)pyrene	42 U	40 U	43 U	44 U	37 U	38 U
Benzo(b)fluoranthene	42 U	40 U	43 U	44 U	37 U	38 U
Benzo(g,h,i)perylene	210 U	200 U	210 U	220 U	190 U	190 U
Benzo(k)fluoranthene	210 U	200 U	210 U	220 U	190 U	190 U
bis(2-Chloroethoxy)methane	210 U	200 U	210 U	220 U	190 U	190 U
bis(2-Chloroethyl)ether	210 U	200 U	210 U	220 U	190 U	190 U
bis(2-Ethylhexyl)phthalate	210 U	200 U	210 U	220 U	190 U	190 U
Butylbenzylphthalate	210 U	200 U	210 U	220 U	190 U	190 U
Caprolactam	210 U	200 U	210 U	220 U	190 U	190 U
Carbazole	210 U	200 U	210 U	220 U	190 U	190 U
Chrysene	210 U	200 U	210 U	220 U	190 U	190 U
Dibenz(a,h)anthracene	42 U	40 U	43 U	44 U	37 U	38 U
Dibenzofuran	210 U	200 U	210 U	220 U	190 U	190 U
Diethylphthalate	210 U	200 U	210 U	220 U	190 U	190 U
Dimethyl phthalate	210 U	200 U	210 U	220 U	190 U	190 U
Di-n-butylphthalate	210 U	200 U	210 U	220 U	190 U	190 U
Di-n-octylphthalate	210 U	200 U	210 U	220 U	190 U	190 U
Fluoranthene	210 U	200 U	210 U	220 U	190 U	190 U
Fluorene	210 U	200 U	210 U	220 U	190 U	190 U
Hexachlorobenzene	210 U	200 U	210 U	220 U	190 U	190 U
Hexachlorobutadiene	210 U	200 U	210 U	220 U	190 U	190 U
Hexachlorocyclopentadiene	210 U	200 U	210 U	220 U	190 U	190 U
Hexachloroethane	210 U	200 U	210 U	220 U	190 U	190 U
Indeno(1,2,3-cd)pyrene	42 U	40 U	43 U	44 U	37 U	38 U
Isophorone	42 U	40 U	43 U	44 U	37 U	38 U
Naphthalene	210 U	200 U	210 U	220 U	190 U	190 U
n-Nitroso-di-n-propylamine	42 U	40 U	43 U	44 U	37 U	38 U
n-Nitrosodiphenylamine	210 U	200 U	210 U	220 U	190 U	190 U
Nitrobenzene	210 U	200 U	210 U	220 U	190 U	190 U
Pentachlorophenol	210 U	200 U	210 U	220 U	190 U	190 U
Phenanthrene	210 U	200 U	210 U	220 U	190 U	190 U
Phenol	210 U	200 U	210 U	220 U	190 U	190 U
Pyrene	210 U	200 U	210 U	220 U	190 U	190 U
Pesticide/Polychlorinated Biphenyls (µg/kg)						
4,4'-DDD	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
4,4'-DDE	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	0.41 J
4,4'-DDT	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aldrin	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
alpha-Chlordane	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Aroclor-1016	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1221	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1232	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1242	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1248	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1254	21 U	20 U	21 U	22 U	19 U	19 U
Aroclor-1260	21 U	20 U	21 U	22 U	19 U	19 U
beta-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
delta-BHC	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dieldrin	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan I	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan II	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endosulfan sulfate	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endrin	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endrin aldehyde	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Endrin ketone	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-BHC (Lindane)	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
gamma-Chlordane	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor epoxide	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Methoxychlor	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Toxaphene	33 U	33 U	33 U	33 U	33 U	33 U
Total Metals (mg/kg)						
Aluminum	17,400	4,520	20,000	17,700	5,270	7,900
Antimony	0.93 J	1.7 U	1.8 U	1.8 U	1.6 U	1.6 U
Arsenic	7.2	1.3 J	13	14.6	0.95 J	2.5
Barium	18.9	9.7	21.8	20	6.6	19.5
Beryllium	0.21	0.057 J	0.31	0.28	0.055 J	0.15 J
Cadmium	0.54 U	0.51 U	0.53 U	0.55 U	0.47 U	0.48 U
Calcium	90 U	84.6 U	89.1 U	92 U	227	97.3
Chromium	27.4	4.7	35.8	34.1	5.6	7.4
Cobalt	0.59	0.28 J	1.1	1	0.26 J	0.65
Copper	3.5	0.66 J	5	4.2	0.86 J	1.5 J



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Station ID	IR17-SB01	IR17-SB02	IR17-SB03		IR17-SB04	IR17-SB05
Sample ID	IR17-SB01-2-4-09C	IR17-SB02-2-7-09C	IR17-SB03-2-7-09C	IR17-SB03D-2-7-09C	IR17-SB04-2-7-09C	IR17-SB05-2-7-09C
Sample Date	07/27/09	07/28/09	07/28/09	07/28/09	07/28/09	07/28/09
Chemical Name						
Iron	16,400	2,240	19,600	28,400	2,500	6,230
Lead	10.7	5.2	15.4	15.9	3.3	6.7
Magnesium	791	179	1,020	836	184	284
Manganese	10.8	8.7	12.1	13.3	5.4	11.4
Mercury	0.039 U	0.036 U	0.04 U	0.041 U	0.033 U	0.049
Nickel	2.1	1.3	2.7	2.5	1.2	1.9
Potassium	943	145	1,070	833	155	225
Selenium	1.8 U	1.7 U	1.2 J	1.4 J	1.6 U	1.6 U
Silver	1.8 U	1.7 U	1.8 U	1.8 U	1.6 U	1.6 U
Sodium	230	22.6 J	106 J	81.9 J	5.3 J	21 J
Thallium	2.7 U	2.5 U	2.7 U	2.8 U	2.4 U	2.4 U
Vanadium	37.6	7	49.4	70.4	7.4	13.2
Zinc	7.5	3.1 J	8.9	8.9	2.4 J	6.3
Wet Chemistry						
pH (ph)	3.8	4.6	4.4	4.3	4.7	NA

**Notes:**

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram



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Station ID	IR17-TW01		IR17-TW02	
Sample ID	IR17-TW01-09C		IR17-TW02-09C	IR17-TW02D-09C
Sample Date	07/29/09		07/29/09	07/29/09
Chemical Name				
<b>Volatile Organic Compounds (µg/l)</b>				
1,1,1-Trichloroethane	1 U	1 UJ	1 UJ	
1,1,2,2-Tetrachloroethane	2.4 U	1 U	1 U	
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1 U	1 U	1 U	
1,1,2-Trichloroethane	1 U	1 U	1 U	
1,1-Dichloroethane	1 U	1 U	1 U	
1,1-Dichloroethene	1 U	1 U	1 U	
1,2,4-Trichlorobenzene	1 U	1 U	1 U	
1,2-Dibromo-3-chloropropane	2 R	2 U	2 U	
1,2-Dibromoethane	1 U	1 U	1 U	
1,2-Dichlorobenzene	1 U	1 U	1 U	
1,2-Dichloroethane	1 U	1 U	1 U	
1,2-Dichloropropane	1 U	1 U	1 U	
1,3-Dichlorobenzene	1 U	1 U	1 U	
1,4-Dichlorobenzene	1 U	1 U	1 U	
2-Butanone	5 U	5 U	5 U	
2-Hexanone	5 U	5 UJ	5 UJ	
4-Methyl-2-pentanone	5 U	5 U	5 U	
Acetone	5 U	5 UJ	5 UJ	
Benzene	1 U	1 U	1 U	
Bromodichloromethane	1 U	1 U	1 U	
Bromoform	1 U	1 U	1 U	
Bromomethane	1.1 U	1 U	1 U	
Carbon disulfide	1 U	1 U	1 U	
Carbon tetrachloride	1 U	1 U	1 U	
Chlorobenzene	1 U	1 U	1 U	
Chloroethane	1 UJ	1 U	1 U	
Chloroform	4.4	1 U	1 U	
Chloromethane	1 UJ	1 UJ	1 UJ	
cis-1,2-Dichloroethene	1 U	1 U	1 U	
cis-1,3-Dichloropropene	1 U	1 U	1 U	
Cyclohexane	1 U	1 U	1 U	
Dibromochloromethane	1 U	1 U	1 U	
Dichlorodifluoromethane (Freon-12)	1 UJ	1 UJ	1 UJ	
Ethylbenzene	1 U	1 U	1 U	
Isopropylbenzene	1 U	1 UJ	1 UJ	
Methyl acetate	1 U	1 U	1 U	
Methylcyclohexane	1 U	1 U	1 U	
Methylene chloride	1 U	1 U	1 U	
Methyl-tert-butyl ether (MTBE)	1 U	1 UJ	1 UJ	
Styrene	1 U	1 U	1 U	
Tetrachloroethene	1.1 U	1 U	1 U	
Toluene	1 U	1 U	1 U	
trans-1,2-Dichloroethene	1 U	1 U	1 U	
trans-1,3-Dichloropropene	1 U	1 U	1 U	
Trichloroethene	5.1 U	1 U	1 U	
Trichlorofluoromethane(Freon-11)	1 UJ	1 UJ	1 UJ	
Vinyl chloride	1 U	1 U	1 U	
Xylene, total	1.2 U	1 U	1 U	
<b>Semivolatile Organic Compounds (µg/l)</b>				
1,1-Biphenyl	10 U	10 U	10 U	
2,2'-Oxybis(1-chloropropane)	10 U	10 U	10 U	
2,4,5-Trichlorophenol	10 U	10 U	10 U	
2,4-Dichlorophenol	10 U	10 U	10 U	
2,4-Dimethylphenol	10 U	10 U	10 U	
2,4-Dinitrophenol	20 U	20 U	20 U	
2,4-Dinitrotoluene	10 U	10 U	10 U	
2,6-Dinitrotoluene	10 U	10 U	10 U	
2-Chloronaphthalene	10 U	10 U	10 U	
2-Chlorophenol	10 U	10 U	10 U	
2-Methylnaphthalene	10 U	10 U	10 U	
2-Methylphenol	10 U	10 U	10 U	
2-Nitroaniline	10 U	10 U	10 U	
2-Nitrophenol	10 U	10 U	10 U	
3,3'-Dichlorobenzidine	20 UJ	20 UJ	20 UJ	
3-Nitroaniline	10 U	10 U	10 U	
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	
4-Bromophenyl-phenylether	10 U	10 U	10 U	
4-Chloro-3-methylphenol	10 U	10 U	10 U	
4-Chloroaniline	10 U	10 U	10 U	
4-Chlorophenyl-phenylether	10 U	10 U	10 U	
4-Methylphenol	20 U	20 U	20 U	
4-Nitroaniline	10 U	10 U	10 U	
4-Nitrophenol	20 U	20 U	20 U	
Acenaphthene	10 U	10 U	10 U	
Acenaphthylene	10 U	10 U	10 U	
Acetophenone	10 U	10 U	10 U	



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Station ID	IR17-TW01		IR17-TW02	
Sample ID	IR17-TW01-09C		IR17-TW02-09C	IR17-TW02D-09C
Sample Date	07/29/09		07/29/09	07/29/09
Chemical Name				
Anthracene	10 U	10 U	10 U	10 U
Atrazine	20 U	20 U	20 U	20 U
Benzaldehyde	10 R	10 R	10 R	10 R
Benzo(a)anthracene	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U
Caprolactam	4.5 J	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	10 U	10 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U
Fluoranthene	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U
n-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U
<b>Pesticide/Polychlorinated Biphenyls (µg/l)</b>				
4,4'-DDD	0.05 U	0.05 U	0.05 U	0.05 U
4,4'-DDE	0.05 U	0.05 U	0.05 U	0.05 U
4,4'-DDT	0.05 U	0.05 U	0.05 U	0.05 U
Aldrin	0.05 U	0.05 U	0.05 U	0.05 U
alpha-BHC	0.05 U	0.05 U	0.05 U	0.05 U
alpha-Chlordane	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1016	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1221	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1232	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1242	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1248	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1254	0.5 U	0.5 U	0.5 U	0.5 U
Aroclor-1260	0.5 U	0.5 U	0.5 U	0.5 U
beta-BHC	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan I	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan II	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan sulfate	0.05 U	0.05 U	0.05 U	0.05 U
Endrin	0.05 U	0.05 U	0.05 U	0.05 U
Endrin aldehyde	0.05 U	0.05 U	0.05 U	0.05 U
Endrin ketone	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.05 U	0.05 U	0.05 U	0.05 U
Methoxychlor	0.05 U	0.05 U	0.05 U	0.05 U
Toxaphene	1 U	1 U	1 U	1 U
<b>Total Metals (µg/l)</b>				
Aluminum	1,680	621 J	1,260	
Antimony	20 U	20 U	20 U	
Arsenic	20 U	20 U	20 U	
Barium	474	8 J	9.2 J	
Beryllium	2 U	0.12 J	0.16 J	
Cadmium	6 U	6 U	6 U	
Calcium	111,000	911 J	893 J	
Chromium	1.8 J	20 U	20 U	
Cobalt	5 U	5 U	5 U	
Copper	20 U	20 U	20 U	



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Station ID	IR17-TW01		IR17-TW02	
Sample ID	IR17-TW01-09C		IR17-TW02-09C	IR17-TW02D-09C
Sample Date	07/29/09		07/29/09	07/29/09
Chemical Name				
Iron	2,590		814	1,170
Lead	3.2 J		20 U	3.2 J
Magnesium	57,300		466	537
Manganese	57.5		16.9	17.7
Mercury	0.25		0.2 U	0.2 U
Nickel	13.8		10 U	10 U
Potassium	8,250		1,010	1,070
Selenium	20 U		3.9 J	4.2 J
Silver	20 U		20 U	20 U
Sodium	499,000		7,220	7,470
Thallium	30 U		30 U	30 U
Vanadium	50 U		50 U	50 U
Zinc	10.2 J		5.7 J	4.9 J
Dissolved Metals (µg/l)				
Aluminum, Dissolved	567 J		1,000 U	1,000 U
Antimony, Dissolved	20 U		20 U	20 U
Arsenic, Dissolved	20 U		20 U	20 U
Barium, Dissolved	498		5.1 J	4.5 J
Beryllium, Dissolved	2 U		0.1 J	2 U
Cadmium, Dissolved	6 U		6 U	6 U
Calcium, Dissolved	110,000		612 J	609 J
Chromium, Dissolved	20 U		20 U	20 U
Cobalt, Dissolved	5 U		5 U	5 U
Copper, Dissolved	3.8 J		20 U	20 U
Iron, Dissolved	2,760		309	296
Lead, Dissolved	2.6 J		20 U	20 U
Magnesium, Dissolved	59,200		263	266
Manganese, Dissolved	64.6		13	11
Mercury, Dissolved	0.2 U		0.2 U	0.2 U
Nickel, Dissolved	15.9		10 U	10 U
Potassium, Dissolved	8,580		1,060	1,040
Selenium, Dissolved	20 U		20 U	4.2 J
Silver, Dissolved	20 U		20 U	20 U
Sodium, Dissolved	510,000		7,650	7,810
Thallium, Dissolved	30 U		30 U	30 U
Vanadium, Dissolved	50 U		50 U	50 U
Zinc, Dissolved	14.7 J		7.9 J	5.2 J

**Notes:**

Shading indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

µg/l - Micrograms per liter



Station ID	IR85-BAT	IR85-SS06	IR85-SS07	IR85-SS08	IR85-SS09		IR85-SS10	IR85-SS11	IR85-SS12	IR85-SS13	IR85-SS14		IR85-SS15	IR85-SS16	IR85-SS17	IR85-SS18
Sample ID	IR85-BAT-071009	IR85-SS06-00-01-09C	IR85-SS07-00-01-09C	IR85-SS08-00-01-09C	IR85-SS09-00-01-09C	IR85-SS09D-00-01-09C	IR85-SS10-00-01-09C	IR85-SS11-00-01-09C	IR85-SS12-00-01-09C	IR85-SS13-00-01-09C	IR85-SS14-00-01-09C	IR85-SS14D-00-01-09C	IR85-SS15-00-01-09C	IR85-SS16-00-01-09C	IR85-SS17-00-01-09C	IR85-SS18-00-01-09C
Sample Date	07/10/09	07/09/09	07/09/09	07/09/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name																
<b>Volatile Organic Compounds (µg/kg)</b>																
1,1,1-Trichloroethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,1,2,2-Tetrachloroethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,1,2-Trichloroethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,1-Dichloroethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,1-Dichloroethene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2,4-Trichlorobenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2-Dibromo-3-chloropropane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2-Dibromoethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2-Dichlorobenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2-Dichloroethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,2-Dichloropropane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,3-Dichlorobenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
1,4-Dichlorobenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
2-Butanone	NA	7.8 J	9.7 UJ	9.5 UJ	12 UJ	6.6 J	4.9 R	12 R	7.3 J	6.9 J	14 J	27 J	8.6 UJ	13 UJ	19 UJ	11 R
2-Hexanone	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
4-Methyl-2-pentanone	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
Acetone	NA	250 J	85 J	65 J	1,300 J	280 J	75 R	320 J	130 J	110 J	270 J	420 J	38 J	40 J	360 J	72 J
Benzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Bromodichloromethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Bromoform	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Bromomethane	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
Carbon disulfide	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Carbon tetrachloride	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Chlorobenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Chloroethane	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
Chloroform	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Chloromethane	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
cis-1,2-Dichloroethene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
cis-1,3-Dichloropropene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Cyclohexane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Dibromochloromethane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Dichlorodifluoromethane (Freon-12)	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Ethylbenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Isopropylbenzene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Methyl acetate	NA	12 J	3.8 J	8 J	84 J	18 J	15 R	6.2 R	20 J	12 J	12 J	26 J	5.7 J	11 J	200 J	5.4 R
Methylcyclohexane	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Methylene chloride	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	14 J	11 R
Methyl-tert-butyl ether (MTBE)	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Styrene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Tetrachloroethene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Toluene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
trans-1,2-Dichloroethene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
trans-1,3-Dichloropropene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Trichloroethene	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Trichlorofluoromethane(Freon-11)	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
Vinyl chloride	NA	10 UJ	9.7 UJ	9.5 UJ	12 UJ	12 UJ	7.3 R	12 R	9.3 UJ	9.7 UJ	11 UJ	11 UJ	8.6 UJ	13 UJ	19 UJ	11 R
Xylene, total	NA	5 UJ	4.9 UJ	4.7 UJ	6.1 UJ	6.1 UJ	3.6 R	6.2 R	4.7 UJ	4.9 UJ	5.3 UJ	5.4 UJ	4.3 UJ	6.2 UJ	9.5 UJ	5.4 R
<b>Semivolatile Organic Compounds (µg/kg)</b>																
1,1-Biphenyl	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,2'-Oxybis(1-chloropropane)	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,4,5-Trichlorophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,4-Dichlorophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,4-Dimethylphenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,4-Dinitrophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,4-Dinitrotoluene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2,6-Dinitrotoluene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Chloronaphthalene	NA	190 U	180 U	190 U	180 U	180 U	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Chlorophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Methylnaphthalene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Methylphenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Nitroaniline	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
2-Nitrophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
3,3'-Dichlorobenzidine	NA	190 UJ	180 UJ	190 UJ	180 UJ	180 UJ	180 UJ	180 UJ	180 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	230 UJ	220 UJ
3-Nitroaniline	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
4,6-Dinitro-2-methylphenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
4-Bromophenyl-phenylether	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 UJ	190 U	190 U	190 U	230 U	220 U
4-Chloro-3-methylphenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
4-Chloroaniline	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U				



CTO-11  
Camp Lejeune - Site 85  
Validated Groundwater Detected Analytical Results  
July 2009

Station ID	IR85-BAT	IR85-SS06	IR85-SS07	IR85-SS08	IR85-SS09		IR85-SS10	IR85-SS11	IR85-SS12	IR85-SS13	IR85-SS14		IR85-SS15	IR85-SS16	IR85-SS17	IR85-SS18
Sample ID	IR85-BAT-071009	IR85-SS06-00-01-09C	IR85-SS07-00-01-09C	IR85-SS08-00-01-09C	IR85-SS09-00-01-09C	IR85-SS09D-00-01-09C	IR85-SS10-00-01-09C	IR85-SS11-00-01-09C	IR85-SS12-00-01-09C	IR85-SS13-00-01-09C	IR85-SS14-00-01-09C	IR85-SS14D-00-01-09C	IR85-SS15-00-01-09C	IR85-SS16-00-01-09C	IR85-SS17-00-01-09C	IR85-SS18-00-01-09C
Sample Date	07/10/09	07/09/09	07/09/09	07/09/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name																
Anthracene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Atrazine	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Benzaldehyde	NA	190 U	180 U	190 U	180 UJ	180 U	180 U	180 UJ	180 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	230 UJ	220 U
Benzo(a)anthracene	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Benzo(a)pyrene	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Benzo(b)fluoranthene	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Benzo(g,h,i)perylene	NA	190 U	180 U	190 U	180 U	180 U	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Benzo(k)fluoranthene	NA	190 U	180 U	190 U	180 U	180 U	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
bis(2-Chloroethoxy)methane	NA	190 U	180 U	190 U	180 U	180 U	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
bis(2-Chloroethyl)ether	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
bis(2-Ethylhexyl)phthalate	NA	140 J	180 U	190 U	58 J	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	29 J	190 U	230 U	220 U
Butylbenzylphthalate	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Caprolactam	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Carbazole	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Chrysene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Dibenz(a,h)anthracene	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Dibenzofuran	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Diethylphthalate	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Dimethyl phthalate	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Di-n-butylphthalate	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Di-n-octylphthalate	NA	190 UJ	180 UJ	190 UJ	180 U	180 UJ	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 UJ
Fluoranthene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Fluorene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Hexachlorobenzene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Hexachlorobutadiene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Hexachlorocyclopentadiene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 R
Hexachloroethane	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Indeno(1,2,3-cd)pyrene	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Isophorone	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
Naphthalene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
n-Nitroso-di-n-propylamine	NA	37 U	36 U	38 U	36 U	36 U	36 U	36 UJ	37 U	38 U	37 U	38 U	39 U	38 U	47 U	43 U
n-Nitrosodiphenylamine	NA	190 U	180 U	190 U	180 U	180 U	180 UJ	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Nitrobenzene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Pentachlorophenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Phenanthrene	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Phenol	NA	190 U	180 U	190 U	180 U	180 U	180 U	180 UJ	180 U	190 U	190 U	190 U	190 U	190 U	230 U	220 U
Pyrene	NA	190 U	180 U	190 U	180 UJ	180 U	180 U	180 UJ	180 UJ	190 UJ	190 U	190 U	190 U	190 UJ	230 U	220 U
Pesticide/Polychlorinated Biphenyls (µg/kg)																
4,4'-DDD	NA	1.9 U	1.8 U	0.93 J	1.8 U	1.8 U	0.39 J	1.8 U	1.4 J	1.9 U	1.9 U	1.9 U	1.9 U	0.97 J	2.3 U	3.1 J
4,4'-DDE	NA	1.9 U	0.99 J	2.7	2.4 J	2.6 J	4.5	0.64 J	3 J	0.71 J	3.1 J	3 J	2.4 J	4.5 J	1.5 J	29 J
4,4'-DDT	NA	1.9 UJ	0.68 J	1.2 J	2.4 J	0.83 J	3 J	1.8 UJ	3.6 J	0.86 J	1.4 J	1.4 J	3 J	1.9 J	4 J	25 J
Aldrin	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
alpha-BHC	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 U
alpha-Chlordane	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Aroclor-1016	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
Aroclor-1221	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
Aroclor-1232	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
Aroclor-1242	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
Aroclor-1248	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
Aroclor-1254	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	40 J	17 U	50	22 U
Aroclor-1260	NA	19 U	18 U	19 U	17 U	18 U	18 U	18 U	17 U	17 U	17 U	17 U	19 U	17 U	23 U	22 U
beta-BHC	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
delta-BHC	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 U
Dieldrin	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 J	2.2 UJ
Endosulfan I	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Endosulfan II	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Endosulfan sulfate	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Endrin	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Endrin aldehyde	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Endrin ketone	NA	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
gamma-BHC (Lindane)	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 U
gamma-Chlordane	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	0.88 J	2.7 J
Heptachlor	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Heptachlor epoxide	NA	1.9 U	1.8 U	1.9 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Methoxychlor	NA	1.9 UJ	1.8 UJ	1.9 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.8 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	1.9 UJ	2.3 UJ	2.2 UJ
Toxaphene	NA	38 U	36 U	38 U	36 UJ	36 U	36 U	36 U	37 UJ	38 UJ	37 UJ	38 UJ	39 UJ	37 UJ	47 UJ	43 UJ
Total Metals (mg/kg)																
Aluminum	7,460 U	6,090 J+	3,780 J+	3,480 J+	3,370 J+	3,250 J+	5,180	5,690	3,960 J+	3,390 J+	7,220 J+	7,300 J+	4,960 J+	4,100 J+	2,980 J+	4,330
Antimony	149 UJ	1.6 U	1.6 U	1.6 U	1.6 UJ	1.5 U	1.5 UJ	1.5 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.6 UJ	1.7 UJ	1.6 UJ	38.5 UJ	5.9 J-
Arsenic	2.2 J	0.83 J	0.78 J	0.85 J	1.1 J	0.93 J	1.1 J	0.91 J	0.83 J	0.57 J	1.2 J	1.2 J	1.5 J	1.9	9.9 J	2.3 J
Barium	37.3 U	10.8	8.6	9.4	10	9	12.6	10.6	9.9	5.9	13.4	13.3	14.2	15.7	31 J	24 U
Beryllium	1.5 U	0.16 U	0.16 U	0.16 U	0.055 J	0.15 U	0.034 J	0.036 J	0.047 J	0.025 J	0.031 J	0.042 J	0.049 J	0.042 J	3.9 U	0.096 J
Cadmium	12	0.49 U	0.47 U	0.49 U	0.47 U	0.46 U	0.45 U	0.46 U	0.48 U	0.48 U	0.48 U	0.49 U	0.59	0.49 U	2.9 J	3.5



Station ID	IR85-BAT	IR85-SS06	IR85-SS07	IR85-SS08	IR85-SS09		IR85-SS10	IR85-SS11	IR85-SS12	IR85-SS13	IR85-SS14		IR85-SS15	IR85-SS16	IR85-SS17	IR85-SS18
Sample ID	IR85-BAT-071009	IR85-SS06-00-01-09C	IR85-SS07-00-01-09C	IR85-SS08-00-01-09C	IR85-SS09-00-01-09C	IR85-SS09D-00-01-09C	IR85-SS10-00-01-09C	IR85-SS11-00-01-09C	IR85-SS12-00-01-09C	IR85-SS13-00-01-09C	IR85-SS14-00-01-09C	IR85-SS14D-00-01-09C	IR85-SS15-00-01-09C	IR85-SS16-00-01-09C	IR85-SS17-00-01-09C	IR85-SS18-00-01-09C
Sample Date	07/10/09	07/09/09	07/09/09	07/09/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09	07/10/09
Chemical Name																
Iron	1,780	2,310	1,690	1,820	2,040	2,000	2,530	1,830	2,010	1,870	3,730	3,700	3,170	3,990	4,820	11,500
Lead	1,640	4.8	7.2	7.8	7.8	6.5	17.5	6.2	17.4	7.2	7.5	7.3	42.6	35.2	165	614
Magnesium	98.1 J	173	108	110	95.8	95.2	173	146	112	98.1	172	178	165	143	80.5 J	143
Manganese	2,740	11.6	9.6	22.6	6.7	7.7	43.7	5.9	20.4	12.6	9.1	9.9	294	417	10,700	1,120
Mercury	222	0.044	0.033 U	0.038	0.032 U	0.037	0.31	0.034 U	0.055	0.039	0.059	0.06	1.1	0.27	5	8.8
Nickel	5.9 J	1.2	0.91	1.1	0.93	0.81	1.3	2.5	1.3	1.4	1.3	1.2	2.2	1.8	8.7 J	2.8 J
Potassium	7,460 U	136	73.1 J	81.7 U	78.3 U	72.1 J	115	96.9	79.5 U	79.3 U	109	117	126	109	1,930 U	117 J
Selenium	14.9 U	1.6 U	1.6 U	1.6 U	1.6 U	1.5 U	1.5 U	1.5 U	1.6 U	1.6 U	0.45 J	1.6 U	1.7 U	1.6 U	38.5 U	9.6 U
Silver	14.9 U	1.6 U	0.083 J	1.6 U	1.6 U	1.5 U	1.5 U	1.5 U	0.15 J	0.21 J	1.6 U	1.6 U	0.11 J	0.29 J	38.5 U	9.6 U
Sodium	1,870 U	3.2 J	3.7 J	204 U	5.7 J	7.5 J	3.4 J	4.3 J	3.9 J	198 U	6.8 J	6.4 J	207 U	206 U	4,820 U	1,200 U
Thallium	NA	2.5 U	2.4 U	2.4 U	2.3 U	2.3 U	2.3 U	2.3 U	2.4 U	2.4 U	2.4 U	2.5 U	2.5 U	0.44 J	18.7 J	14.4 U
Vanadium	373 U	6.6	5.7	5.5	6 J	5.8	7.7	7.1	5.9 J	5.3 J	9.8 J	10 J	7.8 J	7.6 J	96.3 U	9 J
Zinc	45,000	33.4	5.2	31.4	3.9 U	3.9 U	252	4.2	30.2	22.9	4 U	4.1 U	758	406	5,600	2,100
Wet Chemistry																
pH (ph)	NA	4.8	4.5	5.6	4.4	4.5	5.6	4.3	4.8	4.8	4.4	4.4	5.9	6.4	6.4	5.4

Notes:

Shading indicates detections
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NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J- - Analyte present, value may be biased low, actual value may be higher  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units  
µg/kg - Micrograms per kilogram



CTO-11  
Camp Lejeune - Site 85  
Validated Subsurface Soil Raw Analytical Results  
July 2009

Station ID	IR85-SB06	IR85-SB07	IR85-SB08	IR85-SB09	IR85-SB10	IR85-SB11	IR85-SB12	IR85-SB13	IR85-SB14	IR85-SB17	
Sample ID	IR85-SB06-2-7-09C	IR85-SB07-2-4-09C	IR85-SB08-2-7-09C	IR85-SB09-2-7-09C	IR85-SB10-4-7-09C	IR85-SB11-2-7-09C	IR85-SB12-2-7-09C	IR85-SB13-2-7-09C	IR85-SB14-2-7-09C	IR85-SB17-6-7-09C	IR85-SB17D-6-7-09C
Sample Date	07/29/09	07/28/09	07/28/09	07/27/09	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09
Chemical Name											
Volatile Organic Compounds (µg/kg)											
1,1,1-Trichloroethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,1,2,2-Tetrachloroethane	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon- 113)	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,1,2-Trichloroethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,1-Dichloroethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,1-Dichloroethene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,2,4-Trichlorobenzene	2.1 J	1.4 R	2.6 J	1.9 UJ	2 J	2.7 J	1.7 U	1.6 UJ	2 J	1.8 UJ	5.9 R
1,2-Dibromo-3-chloropropane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	2.4 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,2-Dibromoethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,2-Dichlorobenzene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,2-Dichloroethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,2-Dichloropropane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,3-Dichlorobenzene	1.2 J	1.4 R	1.4 J	1.9 UJ	1.6 UJ	1.4 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
1,4-Dichlorobenzene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
2-Butanone	1.5 J	2.8 J	2.3 J	3.8 UJ	2.6 J	2.6 J	3.5 U	4.1 J	3.2 J	1.6 J	12 R
2-Hexanone	3.3 U	2.9 R	4.1 UJ	3.8 UJ	3.1 U	3.8 U	3.5 U	3.3 UJ	3.3 U	3.6 UJ	12 R
4-Methyl-2-pentanone	3.3 U	2.9 R	4.1 UJ	3.8 UJ	3.1 U	1.5 J	3.5 U	3.3 UJ	3.3 U	3.6 UJ	12 R
Acetone	30 J	76 J	39 J	3.8 UJ	69 J	33 J	3.5 U	100 J	75 J	90 J	20 J
Benzene	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Bromodichloromethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Bromoform	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Bromomethane	3.3 R	2.9 R	4.1 R	3.8 UJ	3.1 R	3.8 R	3.5 UJ	3.3 R	3.3 R	3.6 R	12 R
Carbon disulfide	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Carbon tetrachloride	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Chlorobenzene	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Chloroethane	3.3 UJ	2.9 R	4.1 UJ	3.8 UJ	3.1 UJ	3.8 UJ	3.5 U	3.3 UJ	3.3 R	3.6 UJ	12 R
Chloroform	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1 J	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Chloromethane	3.3 U	2.9 R	4.1 UJ	3.8 UJ	3.1 U	3.8 U	3.5 U	3.3 UJ	3.3 U	3.6 UJ	12 R
cis-1,2-Dichloroethene	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
cis-1,3-Dichloropropene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Cyclohexane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Dibromochloromethane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Dichlorodifluoromethane (Freon-12)	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Ethylbenzene	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Isopropylbenzene	2.2 J	1.4 R	2.7 J	1.9 UJ	2 J	2.6 J	1.7 U	2.1 J	1.7 U	1.8 UJ	5.9 R
Methyl acetate	1.6 U	20 J	6.8 J	1.9 UJ	1.6 U	1.3 J	3.4	1.2 J	1.7 U	3 J	5.9 R
Methylcyclohexane	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Methylene chloride	1.7 J	1.9 J	2.3 J	1.4 J	3.1 U	0.88 J	1.7 J	1.4 J	3.3 U	0.62 J	12 R
Methyl-tert-butyl ether (MTBE)	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Styrene	2.2 J	1.4 R	2.8 J	1.9 UJ	2.1 J	2.7 J	1.7 U	2.3 J	3.3 U	2.5 J	5.9 R
Tetrachloroethene	1.3 J	1.4 R	1.6 J	1.9 UJ	1.6 U	1.6 J	1.7 U	1.3 J	1.7 U	1.8 UJ	5.9 R
Toluene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	0.64 J	5.9 R
trans-1,2-Dichloroethene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
trans-1,3-Dichloropropene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Trichloroethene	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Trichlorofluoromethane(Freon-11)	1.6 UJ	1.4 R	2.1 UJ	1.9 UJ	1.6 UJ	1.9 UJ	1.7 U	1.6 UJ	1.7 U	1.8 UJ	5.9 R
Vinyl chloride	3.3 R	2.9 R	4.1 R	3.8 UJ	3.1 R	3.8 R	3.5 UJ	3.3 R	3.3 U	3.6 R	12 R
Xylene, total	1.6 U	1.4 R	2.1 UJ	1.9 UJ	1.6 U	1.9 U	1.7 UJ	1.6 UJ	3.3 U	1.8 UJ	5.9 R
Semivolatile Organic Compounds (µg/kg)											
1,1-Biphenyl	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,2'-Oxybis(1-chloropropane)	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,4,5-Trichlorophenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,4-Dichlorophenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,4-Dimethylphenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,4-Dinitrophenol	180 U	190 U	180 U	190 UJ	190 U	190 U	190 UJ	190 U	190 U	190 U	200 U
2,4-Dinitrotoluene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2,6-Dinitrotoluene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2-Chloronaphthalene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2-Chlorophenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2-Methylnaphthalene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2-Methylphenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U



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Station ID	IR85-SB06	IR85-SB07	IR85-SB08	IR85-SB09	IR85-SB10	IR85-SB11	IR85-SB12	IR85-SB13	IR85-SB14	IR85-SB17	
Sample ID	IR85-SB06-2-7-09C	IR85-SB07-2-4-09C	IR85-SB08-2-7-09C	IR85-SB09-2-7-09C	IR85-SB10-4-7-09C	IR85-SB11-2-7-09C	IR85-SB12-2-7-09C	IR85-SB13-2-7-09C	IR85-SB14-2-7-09C	IR85-SB17-6-7-09C	IR85-SB17D-6-7-09C
Sample Date	07/29/09	07/28/09	07/28/09	07/27/09	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09
Chemical Name											
2-Nitroaniline	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
2-Nitrophenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
3,3'-Dichlorobenzidine	180 U	190 U	180 U	190 UJ	190 U	190 U	190 UJ	190 U	190 UJ	190 U	200 U
3-Nitroaniline	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4,6-Dinitro-2-methylphenol	180 U	190 U	180 U	190 UJ	190 U	190 U	190 UJ	190 U	190 U	190 U	200 U
4-Bromophenyl-phenylether	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4-Chloro-3-methylphenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4-Chloroaniline	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4-Chlorophenyl-phenylether	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4-Methylphenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
4-Nitroaniline	180 UJ	190 UJ	180 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	200 UJ
4-Nitrophenol	180 U	190 U	180 U	190 UJ	190 U	190 U	190 UJ	190 U	190 U	190 U	200 U
Acenaphthene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Acenaphthylene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Acetophenone	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Anthracene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Atrazine	180 UJ	190 UJ	180 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 UJ	190 U	190 UJ	200 UJ
Benzaldehyde	180 R	190 R	180 R	190 R	190 R	190 R	190 R	190 R	190 R	190 R	200 R
Benzo(a)anthracene	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Benzo(a)pyrene	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Benzo(b)fluoranthene	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Benzo(g,h,i)perylene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Benzo(k)fluoranthene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
bis(2-Chloroethoxy)methane	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
bis(2-Chloroethyl)ether	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
bis(2-Ethylhexyl)phthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	58 J	190 U	200 U
Butylbenzylphthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Caprolactam	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Carbazole	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 UJ	190 U	200 U
Chrysene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Dibenz(a,h)anthracene	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Dibenzofuran	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Diethylphthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Dimethyl phthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Di-n-butylphthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Di-n-octylphthalate	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 UJ	190 U	200 U
Fluoranthene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Fluorene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Hexachlorobenzene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Hexachlorobutadiene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Hexachlorocyclopentadiene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 UJ	190 U	200 U
Hexachloroethane	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Indeno(1,2,3-cd)pyrene	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Isophorone	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 U	38 U	39 U
Naphthalene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
n-Nitroso-di-n-propylamine	37 U	37 U	36 U	38 U	37 U	37 U	38 U	37 U	37 UJ	38 U	39 U
n-Nitrosodiphenylamine	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Nitrobenzene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Pentachlorophenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Phenanthrene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Phenol	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Pyrene	180 U	190 U	180 U	190 U	190 U	190 U	190 U	190 U	190 U	190 U	200 U
Pesticide/Polychlorinated Biphenyls (µg/kg)											
4,4'-DDD	1.8 U	1.3 J	1.8 U	1.9	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
4,4'-DDE	2	31	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
4,4'-DDT	1.3 J	10	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Aldrin	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
alpha-BHC	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
alpha-Chlordane	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Aroclor-1016	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
Aroclor-1221	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
Aroclor-1232	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
Aroclor-1242	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U



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Station ID	IR85-SB06	IR85-SB07	IR85-SB08	IR85-SB09	IR85-SB10	IR85-SB11	IR85-SB12	IR85-SB13	IR85-SB14	IR85-SB17	
Sample ID	IR85-SB06-2-7-09C	IR85-SB07-2-4-09C	IR85-SB08-2-7-09C	IR85-SB09-2-7-09C	IR85-SB10-4-7-09C	IR85-SB11-2-7-09C	IR85-SB12-2-7-09C	IR85-SB13-2-7-09C	IR85-SB14-2-7-09C	IR85-SB17-6-7-09C	IR85-SB17D-6-7-09C
Sample Date	07/29/09	07/28/09	07/28/09	07/27/09	07/29/09	07/29/09	07/28/09	07/28/09	07/29/09	07/28/09	07/28/09
Chemical Name											
Aroclor-1248	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
Aroclor-1254	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
Aroclor-1260	17 U	19 UJ	17 UJ	19 U	17 U	17 UJ	19 U	19 U	19 U	17 U	17 U
beta-BHC	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
delta-BHC	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.1 J	1.9 U	1.9 U	2 U
Dieldrin	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endosulfan I	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endosulfan II	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endosulfan sulfate	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endrin	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endrin aldehyde	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Endrin ketone	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
gamma-BHC (Lindane)	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
gamma-Chlordane	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 J	1.9 U	1.9 U	2 U
Heptachlor	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Heptachlor epoxide	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Methoxychlor	1.8 U	1.9 U	1.8 U	1.7 U	1.9 U	1.9 U	1.7 U	1.9 U	1.9 U	1.9 U	2 U
Toxaphene	37 U	37 U	36 U	33 U	37 U	37 U	33 U	37 U	37 U	38 U	39 U
Total Metals (mg/kg)											
Aluminum	3,830	6,420	3,750	12,000	4,090	6,230	5,180	6,180	6,260	2,560	4,610
Antimony	1.6 U	1.6 UJ	1.6 U	1.6 U	1.6 UJ	1.6 UJ	1.6 U	1.6 UJ	1.6 UJ	1.6 U	1.7 UJ
Arsenic	1 J	2.3	0.92 J	1.7	0.68 J	1.2 J	1.2 J	1.1 J	1.4 J	0.67 J	1.7 J
Barium	5.8	11.2	6.6	16.2	4.9	8.9	7.4	9	7.9	4 U	6.1
Beryllium	0.16 U	0.16 U	0.024 J	0.072 J	0.16 U	0.16 U	0.037 J	0.16 U	0.033 J	0.16 U	0.17 U
Cadmium	0.49 U	0.47 U	0.47 U	0.48 U	0.48 U	0.49 U	0.47 U	0.47 U	0.48 U	0.48 U	0.5 U
Calcium	81.2 U	79.1 U	79 U	84.8	80.1 U	80.8 U	79 U	78.2 U	16.6 J	80 U	83 U
Chromium	4.5	7.5	4.3	12.5	4.3	6.1	5.6	5.7	6.3 J	3.7	6.2
Cobalt	0.41 U	0.3 J	0.39 U	0.72	0.21 J	0.4 U	0.21 J	0.39 U	0.4 U	0.4 U	0.42 U
Copper	1.3 J	0.99 J	0.89 J	1.6	0.54 J	0.82 J	0.95 J	1 J	0.8 J	0.8 J	1.7
Iron	2,640	4,620	2,010	5,040	1,670	3,790	3,310	3,440	4,050 J+	1,750	2,940
Lead	5.2	4.8	3.3	7.7	2.8	3.6	4.3	4.5	3.7	3	4.9
Magnesium	131	219	125	424	149	201	158	208	202	84.5	165
Manganese	9.6	6.6	31.2	19	4.5	4.5	5.2	5.9	4.5	3.1	5
Mercury	0.17	0.034 U	0.035	0.037 U	0.035 U	0.035 U	0.033 U	0.036 U	0.033 U	0.033 U	0.034 U
Nickel	0.85	1.5	0.86	2.4	0.76 J	1	1.2	1	1.1	0.8 U	0.83 U
Potassium	104	164	109	306	123	139	131	137	145	95	165
Selenium	1.6 U	1.6 U	1.6 U	0.47 J	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.7 U
Silver	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	0.083 J	0.17 J	1.6 U	0.086 J
Sodium	8.3 J	10.8 J	8.6 J	23.1 J	4.6 J	8.3 J	4.1 J	6.2 J	199 U	3.1 J	5.1 J
Thallium	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.3 U	2.4 U	2.4 U	2.5 U
Vanadium	7.5 J	13.1 J	6.1 J	16.4	6.1 J	10.4 J	8.4	9.3 J	10.5	4.9 J	9 J
Zinc	23.7	4 U	51.2	6.6	4 U	4 U	6.5	10.6	4 U	27.8	52.9
Wet Chemistry											
pH (ph)	4.3	4.6	4.7	4.6	4.4	4.5	NA	4.6	4.2	4.5	4.5

Notes:

Shading indicates detections

NA - Not analyzed  
J - Analyte present, value may or may not be accurate or precise  
J+ - Analyte present, value may be biased high, actual value may be lower  
R - Unreliable Result  
U - The material was analyzed for, but not detected  
UJ - Analyte not detected, quantitation limit may be inaccurate  
mg/kg - Milligrams per kilogram  
ph - pH units  
µg/kg - Micrograms per kilogram



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Station ID	IR85-MW01	IR85-MW02	IR85-MW04	IR85-MW05	IR85-TW04	IR85-TW05	IR85-TW06		IR85-TW07	IR85-TW08
Sample ID	IR85-MW01-09C	IR85-MW02-09C	IR85-MW04-09C	IR85-MW05-09C	IR85-TW04-09C	IR85-TW05-09C	IR85-TW06-09C	IR85-TW06D-09C	IR85-TW07-09C	IR85-TW08-09C
Sample Date	07/23/09	07/23/09	07/22/09	07/21/09	07/27/09	07/29/09	07/30/09	07/30/09	07/30/09	07/30/09
Chemical Name										
<b>Volatile Organic Compounds (µg/l)</b>										
1,1,1-Trichloroethane	1 U	1 U	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
1,1,2,2-Tetrachloroethane	1 U	1 U	1 U	1 UJ	1 U	2.4 U	2.4 U	2.4 U	2.4 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
1,2,4-Trichlorobenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	2 U	2 U	2 R	2 UJ	2 U	2 U	2 R	2 R	2 R	2 U
1,2-Dibromoethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 UJ
4-Methyl-2-pentanone	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	5 UJ	5 UJ	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Bromodichloromethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	1 U	1 U	1 U	1 UJ	1.1 U	1.1 R	1.1 U	1.1 U	1.1 U	1 UJ
Carbon disulfide	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Carbon tetrachloride	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	1 U	1 U	1 U	1 UJ	1 U	1 R	1 UJ	1 UJ	1 UJ	1 U
Chloroform	1 U	6.2	1 U	11 J	1 U	1 U	1 U	1 U	1 U	2.2 UJ
Chloromethane	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
cis-1,2-Dichloroethene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Cyclohexane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Dibromochloromethane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (Freon-12)	1 UJ	1 UJ	1 U	1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Ethylbenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Methyl acetate	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Methylcyclohexane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Methylene chloride	1 U	1 U	1 UJ	1 UJ	1 U	1 U	190	190	1 U	14 J
Methyl-tert-butyl ether (MTBE)	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Styrene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	1 U	1 U	1 U	1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1 U
Toluene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
trans-1,2-Dichloroethene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	1 U	1 U	1 U	1 UJ	5.1 U	5.1 U	5.1 U	5.1 U	5.1 U	1 UJ
Trichlorofluoromethane(Freon-11)	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Vinyl chloride	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ
Xylene, total	1 U	1 U	1 U	1 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1 UJ
<b>Semivolatile Organic Compounds (µg/l)</b>										
1,1-Biphenyl	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,2'-Oxybis(1-chloropropane)	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	20 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U



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Station ID	IR85-MW01	IR85-MW02	IR85-MW04	IR85-MW05	IR85-TW04	IR85-TW05	IR85-TW06		IR85-TW07	IR85-TW08
Sample ID	IR85-MW01-09C	IR85-MW02-09C	IR85-MW04-09C	IR85-MW05-09C	IR85-TW04-09C	IR85-TW05-09C	IR85-TW06-09C	IR85-TW06D-09C	IR85-TW07-09C	IR85-TW08-09C
Sample Date	07/23/09	07/23/09	07/22/09	07/21/09	07/27/09	07/29/09	07/30/09	07/30/09	07/30/09	07/30/09
Chemical Name										
2-Chlorophenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	20 UJ	21 UJ	21 UJ	20 U	21 UJ	20 U	20 UJ	20 UJ	20 UJ	20 UJ
3-Nitroaniline	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Methylphenol	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
4-Nitroaniline	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
Acenaphthene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Atrazine	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
Benzaldehyde	10 UJ	10 UJ	10 UJ	10 UJ	11 R	10 R	10 R	10 R	10 R	10 R
Benzo(a)anthracene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Caprolactam	10 U	10 U	10 U	10 U	11 UJ	10 U	10 U	10 U	10 U	10 U
Carbazole	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Dimethyl phthalate	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
Di-n-octylphthalate	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
n-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	10 U	10 U	10 U	10 U	11 UJ	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	20 U	21 U	21 U	20 U	21 U	20 U	20 U	20 U	20 U	20 U
Phenanthrene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Phenol	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U
Pesticide/Polychlorinated Biphenyls (µg/l)										
4,4'-DDD	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.079 J	0.05 U	0.05 U	0.05 U
4,4'-DDE	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
4,4'-DDT	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aldrin	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U



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Station ID	IR85-MW01	IR85-MW02	IR85-MW04	IR85-MW05	IR85-TW04	IR85-TW05	IR85-TW06		IR85-TW07	IR85-TW08
Sample ID	IR85-MW01-09C	IR85-MW02-09C	IR85-MW04-09C	IR85-MW05-09C	IR85-TW04-09C	IR85-TW05-09C	IR85-TW06-09C	IR85-TW06D-09C	IR85-TW07-09C	IR85-TW08-09C
Sample Date	07/23/09	07/23/09	07/22/09	07/21/09	07/27/09	07/29/09	07/30/09	07/30/09	07/30/09	07/30/09
Chemical Name										
alpha-BHC	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
alpha-Chlordane	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor-1016	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1221	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1232	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1242	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1248	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1254	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
Aroclor-1260	0.51 U	0.51 U	0.78 U	0.5 U	0.53 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ
beta-BHC	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
delta-BHC	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan I	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan II	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan sulfate	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endrin	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endrin aldehyde	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Endrin ketone	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methoxychlor	0.051 U	0.052 U	0.078 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Toxaphene	1 U	1 U	1.6 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Total Metals (µg/l)										
Aluminum	124 J	873 J	560 J	469 J	182 J	110 J	15,100	9,130	148 J	921 J
Antimony	20 U	40 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic	20 U	2 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Barium	50 U	56.9	39.6 J	37 J	24.2 J	41.3 J	50 U	50 U	50 U	50 U
Beryllium	0.11 J	0.27 J	0.17 J	0.11 J	0.098 J	2 U	2 U	2 U	2 U	2 U
Cadmium	6 U	6 U	0.14 J	6 U	6 U	0.16 J	6 U	6 U	6 U	0.28 J
Calcium	569 J	1,330 J	1,960	760 J	579 J	1,130	3,190	3,140	2,200	1,280
Chromium	20 U	20 U	20 U	20 U	20 U	20 U	18.9 J	11.7 J	20 U	1.8 J
Cobalt	5 U	0.67 J	0.78 J	5 U	0.89 J	1.2 J	5 U	5 U	0.64 J	5 U
Copper	20 U	40 U	20 U	20 U	2.4 J	2.4 J	6.8 J	6.2 J	4.1 J	5.6 J
Iron	166	1,050	425	106 J	531	6,380	6,900	4,770	1,110	1,480
Lead	20 U	40 U	2.4 J	20 U	20 U	20 U	15.9 J	12.7 J	20 U	3.7 J
Magnesium	1,350	2,310	445	2,480	836	2,510	2,060	1,540	1,160	379
Manganese	8	22	5.8	4.2 J	9.6	72.5	70.8	66.4	29	36.5
Mercury	0.2 U	0.085 J	0.2 U	0.2 U	0.036 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	1.2 J	3 J	1.5 J	10 U	10 U	19.7	7.9 J	6.6 J	9.5 J	2.2 J
Potassium	498 J	2,180	496 J	650 J	726 J	813 J	1,210	1,010	624 J	656 J
Selenium	20 U	20 U	20 U	20 U	20 U	4.3 J	20 U	20 U	20 U	20 U
Silver	20 U	20 U	20 U	20 U	1.5 J	20 U	20 U	20 U	20 U	20 U
Sodium	6,620	14,900	4,910	5,140	3,070	4,510	26,800	25,700	2,840	13,200
Thallium	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U	30 U
Vanadium	50 U	100 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	4.4 J	16.6 J	12.6 J	50 U	50 U	30.9 J	48 J	41.1 J	13.7 J	110
Dissolved Metals (µg/l)										
Aluminum, Dissolved	NA	NA	NA	NA	41.2 J	92.7 J	1,000 U	1,000 U	106 J	1,000 U
Antimony, Dissolved	NA	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U
Arsenic, Dissolved	NA	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U
Barium, Dissolved	NA	NA	NA	NA	23.3 J	41.5 J	50 U	50 U	50 U	50 U
Beryllium, Dissolved	NA	NA	NA	NA	2 U	0.13 J	2 U	2 U	2 U	2 U
Cadmium, Dissolved	NA	NA	NA	NA	6 U	6 U	6 U	6 U	6 U	6 U
Calcium, Dissolved	NA	NA	NA	NA	586 J	1,140	1,000 U	1,000 U	2,130	1,000 U
Chromium, Dissolved	NA	NA	NA	NA	20 U	20 U	20 U	20 U	1.4 J	20 U
Cobalt, Dissolved	NA	NA	NA	NA	0.82 J	1.1 J	5 U	5 U	0.76 J	5 U
Copper, Dissolved	NA	NA	NA	NA	20 U	2.6 J	20 U	2.2 J	5.2 J	20 U



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Station ID	IR85-MW01	IR85-MW02	IR85-MW04	IR85-MW05	IR85-TW04	IR85-TW05	IR85-TW06		IR85-TW07	IR85-TW08
Sample ID	IR85-MW01-09C	IR85-MW02-09C	IR85-MW04-09C	IR85-MW05-09C	IR85-TW04-09C	IR85-TW05-09C	IR85-TW06-09C	IR85-TW06D-09C	IR85-TW07-09C	IR85-TW08-09C
Sample Date	07/23/09	07/23/09	07/22/09	07/21/09	07/27/09	07/29/09	07/30/09	07/30/09	07/30/09	07/30/09
Chemical Name										
Iron, Dissolved	NA	NA	NA	NA	433	6,090	150 U	150 U	1,050	144 J
Lead, Dissolved	NA	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U
Magnesium, Dissolved	NA	NA	NA	NA	817	2,460	250 U	250 U	1,150	130 J
Manganese, Dissolved	NA	NA	NA	NA	9.9	70.1	1.5 J	1.3 J	28.8	15.3
Mercury, Dissolved	NA	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.04 J	0.2 U
Nickel, Dissolved	NA	NA	NA	NA	10 U	19.5	10 U	10 U	9.6 J	1.3 J
Potassium, Dissolved	NA	NA	NA	NA	688 J	852 J	506 J	492 J	559 J	624 J
Selenium, Dissolved	NA	NA	NA	NA	20 U	4.3 J	20 U	20 U	20 U	20 U
Silver, Dissolved	NA	NA	NA	NA	20 U	20 U	20 U	20 U	20 U	20 U
Sodium, Dissolved	NA	NA	NA	NA	2,920	4,660	27,300	26,500	2,800	13,600
Thallium, Dissolved	NA	NA	NA	NA	30 U	30 U	30 U	30 U	30 U	30 U
Vanadium, Dissolved	NA	NA	NA	NA	50 U	50 U	50 U	50 U	50 U	50 U
Zinc, Dissolved	NA	NA	NA	NA	6.8 J	31.5 J	50 U	50 U	13.5 J	49.5 J

Notes:

- Shading indicates detections
- NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

µg/l - Micrograms per liter



Appendix E  
Human Health Risk Screening Information

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Table 2.1  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Construction Area  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future Medium: Surface Soil Exposure Medium: Surface Soil
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Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
CJCA	7440-36-0	Antimony	1.8E-01 J-	4.9E-01 J-	MG/KG	CJCA-SS163D-09C	15/214	1.5 - 17.8	4.9E-01	4.5E-01	3.1E+00 N	N/A		NO	BSL
	<b>7440-38-2</b>	<b>Arsenic</b>	<b>2.2E-01 J-</b>	<b>6.9E+00</b>	<b>MG/KG</b>	<b>CJCA-SS136-09C</b>	<b>202/214</b>	<b>1.5 - 17.8</b>	<b>6.9E+00</b>	<b>6.3E-01</b>	<b>3.9E-01 C*</b>	<b>5.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-50-8	Copper	2.6E-01 J-	2.6E+01	MG/KG	CJCA-SS033-09C	204/214	0.79 - 8.9	2.6E+01	4.8E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	7439-92-1	Lead	9.6E-01	1.2E+02	MG/KG	CJCA-SS033-09C	214/214	0.79 - 8.9	1.2E+02	1.2E+01	4.0E+02 NL	2.7E+02	NCPSRG	NO	BSL
	7440-66-6	Zinc	1.1E+00 J	1.2E+02	MG/KG	CJCA-SS041-09C	159/214	1.6 - 17.8	1.2E+02	1.1E+01	2.3E+03 N	1.2E+03	NCPSRG	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values are two times the arithmetic mean basewide background surface soil concentrations.  
Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.  
<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

[5] Rationale Codes

Selection Reason:	Above Screening Levels (ASL)
Deletion Reason:	No Toxicity Information (NTX)
	Essential Nutrient (NUT)
	Below Screening Level (BSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/

To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

J = Estimated Value

J- = Analyte present. Value may be biased low, actual value may be higher.

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.



**TABLE 2.1a**

Risk Ratio Screening for Surface Soil, Maximum Detected Concentration  
 Camp Johnson Construction Area  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Arsenic	202 / 214	6.9E+00	CJCA-SS136-09C	3.9E-01	1E-06	NA	2E-05	NA
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>NA</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>2E-05</b>	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

mg/kg = milligrams per kilogram

NA = Not available/not applicable



Table 2.2  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Construction Area  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
CJCA	7440-36-0	Antimony	1.8E-01 J-	4.9E-01 J-	MG/KG	CJCA-SS163D-09C	16/292	1.5 - 17.8	4.9E-01	3.6E-01	3.10E+00 N	N/A		NO	BSL
	<b>7440-38-2</b>	<b>Arsenic</b>	<b>1.7E-01 J</b>	<b>4.7E+01 J-</b>	<b>MG/KG</b>	<b>CJCA-SB71-6-7-09C</b>	<b>271/292</b>	<b>1.5 - 17.8</b>	<b>4.7E+01</b>	<b>6.3E-01</b>	<b>3.90E-01 C*</b>	<b>5.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-50-8	Copper	2.6E-01 J-	2.6E+01	MG/KG	CJCA-SB09D-2-4-09C	277/292	1.5 - 17.8	2.6E+01	2.6E+00	3.10E+02 N	7.0E+02	NCPSRG	NO	BSL
	7439-92-1	Lead	9.6E-01	1.2E+02	MG/KG	CJCA-SS033-09C	292/292	1.5 - 17.8	1.2E+02	8.5E+00	4.00E+02 NL	2.7E+02	NCPSRG	NO	BSL
	7440-66-6	Zinc	1.1E+00 J	1.2E+02	MG/KG	CJCA-SS041-09C	209/292	1.6 - 17.8	1.2E+02	6.6E+00	2.30E+03 N	1.2E+03	NCPSRG	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values are lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.  
Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.  
<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

J = Estimated Value

J- = Analyte present. Value may be biased low, actual value may be higher.

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.



**TABLE 2.2a**

Risk Ratio Screening for Surface and Subsurface Soil, Maximum Detected Concentration

Camp Johnson Construction Area

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Metals (mg/kg)								
Arsenic	271 / 292	4.7E+01 J-	CJCA-SS136-09C	3.9E-01	1E-06	NA	1E-04	NA
Cumulative Corresponding Hazard Index <sup>c</sup>						NA		
Cumulative Corresponding Cancer Risk <sup>d</sup>							1E-04	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J- = Analyte present. Value may be biased low, actual value may be higher

mg/kg = milligrams per kilogram

NA = Not available/not applicable.



**TABLE 2.2b**

Risk Ratio Screening for Surface and Subsurface Soil, 95% UCL Concentration

Camp Johnson Construction Area

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	95% UCL	95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Arsenic	271 / 292	3.9E+00 4	95% KM-c	3.9E-01	1E-06	NA	1E-05	NA
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>NA</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>1E-05</b>	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable.

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010. ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Kaplan-Meier (Chebyshev) UCL (95% KM-c)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.



Table 2.3  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Construction Area  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
CJCA	7440-36-0	Antimony	ND	ND	UG/L		0/37	20 - 100	1.0E+02	3.3E+00	1.5E+00 N	6.0E+00	MCL	YES	DLASL
	7440-38-2	Arsenic	2.2E+00 J	9.4E+00 J	UG/L	CJCA-TW27-09C	12/37	20 - 20	9.4E+00	5.8E+00	4.5E-02 C	1.0E+01	MCL, 15A NCAC 2L	YES	ASL
	7440-50-8	Copper	2.7E+00 J	1.0E+01 J	UG/L	CJCA-TW17-09C	12/37	20 - 100	1.0E+01	2.8E+00	1.5E+02 N	1.3E+03	MCL	NO	BSL
	7439-92-1	Lead	2.0E+00 J	1.9E+01 J	UG/L	CJCA-TW01-09C	12/37	20 - 100	1.9E+01	2.8E+00	N/A	1.5E+01	MCL, 15A NCAC 2L	YES	ASL
	7440-66-6	Zinc	4.3E+00 J	1.6E+02	UG/L	CJCA-TW17-09C	36/37	50 - 250	1.6E+02	4.2E+01	1.1E+03 N	1.0E+03	15A NCAC 2L	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background shallow groundwater concentrations. Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels for Chemical Contaminants at Superfund Sites. <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) tap water RSLs.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards  
15A NCAC 2L = North Carolina Classifications and Groundwater Quality Standards,  
January 2010.

J = Estimated Value

C\* = N screening level < 100x C screening level, therefore  
N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore  
N screening value/10 used as screening level

N = Noncarcinogenic

N/A = Not available

ND = Not detected

UG/L = Micrograms per liter

Generated by: Roni Warren/WDC Checked by: Geanine Howard-Peebles/DAY

Updated by: D. Stannard/WDC Checked by: R. Warren



**TABLE 2.3a**

Risk Ratio Screening for Groundwater, Maximum Detected Concentration

Camp Johnson Construction Area

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Metals (ug/L)								
Arsenic	12 / 37	9.4E+00 J	CJCA-TW27-09C	4.5E-02	1E-06	NA	2E-04	NA
Lead	12 / 37	1.9E+01 J	CJCA-TW01-09C	NA		NA	NA	
Cumulative Corresponding Hazard Index <sup>c</sup>						NA		
Cumulative Corresponding Cancer Risk <sup>d</sup>							2E-04	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

ug/L = micrograms per liter

NA = Not available/not applicable



**TABLE 2.3b**

Risk Ratio Screening for Groundwater, 95% UCL Concentration

Camp Johnson Construction Area

MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL		95% UCL Rationale	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte									
Metals (ug/L)									
Arsenic	12 / 37	5.0E+00	95% KM-t	1, 3	4.5E-02	1E-06	NA	1E-04	NA
Lead	12 / 37	8.9E+00	Mean	6	NA		NA	NA	
Cumulative Corresponding Hazard Index <sup>c</sup>							NA		
Cumulative Corresponding Cancer Risk <sup>d</sup>								1E-04	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05,

otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

NA = Not available/not applicable

ug/L = micrograms per liter

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations

in users guide (USEPA, May 2010. ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Kaplan-Meier (t) UCL (95% KM-t); Arithmetic Mean (Mean)

Upper Confidence Limit (UCL) Rationale:

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.

(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.

(3) Test indicates data are gamma distributed.

(4) Distribution tests are inconclusive

(5) Max value used because 95% UCL greater than max.

(6) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Table 2.4  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
Site 15	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR15-SS08-00-01-09C	0/12	0.0042 - 0.0091	9.1E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.1E+00 C	N/A		NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	DLBSL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	YES	DLASL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	8.9E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.4E+00 C	N/A		NO	DLBSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	DLBSL
	78-93-3	2-Butanone	4.4E-03 J	4.0E-02 J	MG/KG		7/12	0.0085 - 0.018	4.0E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	ND	ND	MG/KG		0/12	0.0085 - 0.018	1.8E-02	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	DLBSL
	108-10-1	4-Methyl-2-pentanone	ND	ND	MG/KG		0/12	0.0085 - 0.018	1.8E-02	N/A	5.3E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	5.3E-03 J	1.7E+00 J	MG/KG	IR15-SS08-00-01-09C	12/13	0.0085 - 0.036	1.7E+00	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	DLBSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/10	0.0054 - 0.012	1.2E-02	N/A	7.3E-01 N	N/A		NO	DLBSL
	75-15-0	Carbon disulfide	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	DLBSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/12	0.0054 - 0.014	1.4E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	5.2E-03 J	5.2E-03 J	MG/KG		1/12	0.0042 - 0.0091	5.2E-03	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	BSL
	74-87-3	Chloromethane	ND	ND	MG/KG		0/12	0.0054 - 0.014	1.4E-02	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	110-82-7	Cyclohexane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.2E+02 NS	N/A		NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL
	98-82-8	Isopropylbenzene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	DLBSL
	79-20-9	Methyl acetate	4.5E-03 J	2.1E+00	MG/KG	IR15-SS08-00-01-09C	5/13	0.0042 - 0.72	2.1E+00	N/A	7.8E+03 N	N/A		NO	BSL



Table 2.4  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	108-87-2	Methylcyclohexane	ND	ND	MG/KG	IR15-SS08-00-01-09C	0/12	0.0042 - 0.0091	9.1E-03	N/A	5.7E+01 N	N/A		NO	DLBSL
	75-09-2	Methylene chloride	ND	ND	MG/KG		0/12	0.0054 - 0.014	1.4E-02	N/A	1.1E+01 C	2.3E-02	NCPSRG	NO	DLBSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	4.3E+01 C	8.5E-02	NCPSRG	NO	DLBSL
	100-42-5	Styrene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.3E+02 N	9.2E-01	NCPSRG	NO	DLBSL
	127-18-4	Tetrachloroethene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	5.5E-01 C	5.0E-03	NCPSRG	NO	DLBSL
	108-88-3	Toluene	1.0E-02 J	1.0E-02 J	MG/KG		1/12	0.0042 - 0.0091	1.0E-02	N/A	5.0E+02 N	5.5E+00	NCPSRG	NO	BSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.5E+01 N	5.1E-01	NCPSRG	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	2.8E+00 C	1.8E-02	NCPSRG	NO	DLBSL
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	7.9E+01 N	2.4E+01	NCPSRG	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/12	0.0054 - 0.014	1.4E-02	N/A	6.0E-02 C	1.9E-04	NCPSRG	NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/12	0.0042 - 0.0091	9.1E-03	N/A	6.3E+01 N	6.0E+00	NCPSRG	NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.1E+02 NS	4.3E+01	NCPSRG	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	MG/KG		0/5	0.36 - 0.4	4.0E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.9E+01 N	4.1E-03	NCPSRG	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.1E+01 N	1.6E+00	NCPSRG	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	m&pCRESOL	3- and 4-Methylphenol	ND	ND	MG/KG		0/5	0.73 - 0.8	8.0E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	6.1E-01 N	N/A		YES	DLASL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/10	0.17 - 0.21	2.1E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL



Table 2.4  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.4E+02 N	8.4E+00	NCPSRG	NO	DLBSL
	208-96-8	Acenaphthylene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	7.8E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/15	0.035 - 0.4	4.0E-01	N/A	1.5E-01 C	1.8E-01	NCPSRG	YES	DLASL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/15	0.035 - 0.4	4.0E-01	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/15	0.035 - 0.4	4.0E-01	N/A	1.5E-01 C	6.0E-01	NCPSRG	YES	DLASL
	191-24-2	Benzo(g,h,i)perylene	9.5E-02 J	9.5E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/15	0.17 - 0.4	9.5E-02	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	BSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	8.8E-02 J	1.8E-01 J	MG/KG	IR15-SS01-00-01-09C	3/15	0.17 - 0.4	1.8E-01	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	1.9E-01 J	1.9E-01 J	MG/KG	IR15-SS01-00-01-09C	1/15	0.17 - 0.4	1.9E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	BSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/14	0.17 - 1	1.0E+00	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	1.5E-02 J	2.2E-02 J	MG/KG	SWMU46-SM01-0-1	2/15	0.17 - 0.4	2.2E-02	N/A	1.5E+01 C	1.8E+01	NCPSRG	YES	CPAH
	53-70-3	Dibenz(a,h)anthracene	6.4E-02 J	6.4E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/15	0.035 - 0.4	6.4E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	ASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	5.0E-02 J	1.5E-01 J	MG/KG	IR15-SS10-00-01-09C	6/15	0.17 - 0.4	1.5E-01	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	BSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	YES	DLASL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	3.7E+01 N	N/A		NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.2E-02 J	5.2E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/15	0.035 - 0.4	5.2E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	YES	CPAH
	78-59-1	Isophorone	ND	ND	MG/KG		0/15	0.035 - 0.4	4.0E-01	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/15	0.035 - 0.4	4.0E-01	N/A	6.9E-02 C	N/A		YES	DLASL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	9.9E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL



Table 2.4  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
 Camp Johnson Site 15  
 MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
 Medium: Surface Soil  
 Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/15	0.17 - 1	1.0E+00	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL
	108-95-2	Phenol	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/15	0.17 - 0.4	4.0E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	1.3E-03 JP	7.5E-03 J	MG/KG	IR15-SS01-00-01-09C	4/15	0.0017 - 0.0021	7.5E-03	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	BSL
	72-55-9	4,4'-DDE	5.6E-04 J	2.5E-02 J	MG/KG	IR15-SS01-00-01-09C	10/15	0.0017 - 0.0021	2.5E-02	N/A	1.4E+00 C	N/A		NO	BSL
	50-29-3	4,4'-DDT	3.9E-04 J	2.4E-02 J	MG/KG	IR15-SS10-00-01-09C	9/15	0.0017 - 0.0021	2.4E-02	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	2.9E-02 C*	N/A		NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	1.0E-03 J	7.4E-03 J	MG/KG	IR15-SS01-00-01-09C	3/15	0.0017 - 0.0021	7.4E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	3.9E-01 N	N/A		NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	<b>11097-69-1</b>	<b>Aroclor-1254</b>	<b>3.6E-01 J</b>	<b>3.6E-01 J</b>	<b>MG/KG</b>	<b>IR15-SS01-00-01-09C</b>	<b>1/15</b>	<b>0.017 - 0.021</b>	<b>3.6E-01</b>	<b>N/A</b>	<b>1.1E-01 C**</b>	<b>N/A</b>		<b>YES</b>	<b>ASL</b>
	11096-82-5	Aroclor-1260	ND	ND	MG/KG		0/15	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	60-57-1	Dieldrin	9.1E-04 J	1.7E-03 J	MG/KG	IR15-SS09-00-01-09C	2/15	0.0017 - 0.0021	1.7E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	BSL
	959-98-8	Endosulfan I	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	1.1E-03 JP	1.1E-03 JP	MG/KG	SWMU46-SM01-0-1	1/15	0.0017 - 0.0021	1.1E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	BSL
	1031-07-8	Endosulfan sulfate	1.6E-02 P	3.8E-02 D	MG/KG	SWMU46-SM03-0-1	4/15	0.0017 - 0.0037	3.8E-02	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	BSL
	72-20-8	Endrin	1.7E-03 JP	1.7E-03 JP	MG/KG	SWMU46-SM01-0-1	1/15	0.0017 - 0.0021	1.7E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	BSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	3.8E-03 P	1.8E-02 P	MG/KG	SWMU46-SM05-0-1	4/15	0.0017 - 0.0021	1.8E-02	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	BSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	5.8E-04 J	8.6E-03 J	MG/KG	IR15-SS01-00-01-09C	3/15	0.0017 - 0.0021	8.6E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	76-44-8	Heptachlor	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/15	0.0017 - 0.0021	2.1E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	4.6E-03 J	4.6E-03 J	MG/KG	SWMU46-SM01-0-1	1/15	0.0017 - 0.008	4.6E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	BSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/15	0.035 - 0.1	1.0E-01	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	<b>7429-90-5</b>	<b>Aluminum</b>	<b>1.2E+03 J+</b>	<b>1.3E+04</b>	<b>MG/KG</b>	<b>IR15-SS03-00-01-09C</b>	<b>10/10</b>	<b>75.3 - 90.9</b>	<b>1.3E+04</b>	<b>5.5E+03</b>	<b>7.7E+03 N</b>	<b>N/A</b>		<b>YES</b>	<b>ASL</b>
	7440-36-0	Antimony	2.7E-01 J	6.4E-01 J-	MG/KG	IR15-SS01-00-01-09C	4/10	1.5 - 1.8	6.4E-01	4.5E-01	3.1E+00 N	N/A		NO	BSL
	<b>7440-38-2</b>	<b>Arsenic</b>	<b>2.4E-01 J</b>	<b>4.7E+00</b>	<b>MG/KG</b>	<b>IR15-SS03D-00-01-09C</b>	<b>16/16</b>	<b>0.27 - 1.8</b>	<b>4.7E+00</b>	<b>6.3E-01</b>	<b>3.9E-01 C*</b>	<b>5.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-39-3	Barium	9.1E-01	3.4E+01	MG/KG	IR15-SS01-00-01-09C IR15-SS03D-00-01-09C	16/16	1.4 - 4.5	3.4E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	3.9E-02 J	1.4E-01 J	MG/KG	IR15-SS03-00-01-09C	5/10	0.15 - 0.18	1.4E-01	1.0E-01	1.6E+01 N	N/A		NO	BSL



Table 2.4  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	7440-43-9	Cadmium	1.4E-02 J	6.1E-01	MG/KG	IR15-SS01-00-01-09C	8/16	0.011 - 0.55	6.1E-01	3.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL
	7440-70-2	Calcium	9.4E+01	3.7E+04	MG/KG	IR15-SS01-00-01-09C	10/10	75.3 - 90.9	3.7E+04	6.4E+03	N/A	N/A		NO	NUT
	<b>7440-47-3</b>	<b>Chromium</b>	<b>1.4E+00 J</b>	<b>1.7E+01</b>	<b>MG/KG</b>	<b>IR15-SS03D-00-01-09C</b>	<b>16/16</b>	<b>0.27 - 1.8</b>	<b>1.7E+01</b>	<b>6.1E+00</b>	<b>2.9E-01 C</b>	<b>3.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-48-4	Cobalt	6.7E-02 J	5.7E-01	MG/KG	IR15-SS03-00-01-09C	8/10	0.38 - 0.45	5.7E-01	2.9E-01	2.3E+00 N	N/A		NO	BSL
	7440-50-8	Copper	5.4E-01 J	4.2E+01	MG/KG	IR15-SS01-00-01-09C	10/10	1.5 - 1.8	4.2E+01	4.8E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	<b>7439-89-6</b>	<b>Iron</b>	<b>5.6E+02</b>	<b>1.0E+04</b>	<b>MG/KG</b>	<b>IR15-SS03D-00-01-09C</b>	<b>10/10</b>	<b>11.3 - 13.6</b>	<b>1.0E+04</b>	<b>3.2E+03</b>	<b>5.5E+03 N</b>	<b>1.5E+02</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7439-92-1	Lead	3.0E+00	7.0E+01	MG/KG	IR15-SS01-00-01-09C	16/16	0.27 - 1.8	7.0E+01	1.2E+01	4.0E+02 NL	2.7E+02	NCPSRG	NO	BSL
	7439-95-4	Magnesium	4.7E+01	8.0E+02	MG/KG	IR15-SS03D-00-01-09C	10/10	18.8 - 22.7	8.0E+02	2.4E+02	N/A	N/A		NO	NUT
	7439-96-5	Manganese	4.6E+00	2.2E+01	MG/KG	IR15-SS01-00-01-09C	10/10	0.38 - 0.45	2.2E+01	1.4E+01	1.8E+02 N	6.5E+01	NCPSRG	NO	BSL
	7439-97-6	Mercury	1.9E-02 J	5.1E-01	MG/KG	IR15-SS01-00-01-09C	6/15	0.033 - 0.1	5.1E-01	8.1E-02	2.3E+00 N	1.0E+00	NCPSRG	NO	BSL
	7440-02-0	Nickel	4.8E-01 J	2.7E+00	MG/KG	IR15-SS01-00-01-09C	10/10	0.75 - 0.91	2.7E+00	1.2E+00	1.6E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	1.1E+02	5.0E+02	MG/KG	IR15-SS03-00-01-09C	7/10	75.3 - 90.9	5.0E+02	1.2E+02	N/A	N/A		NO	NUT
	7782-49-2	Selenium	2.0E-01 J	5.2E-01	MG/KG	SWMU46-SM08-0-1	7/16	0.27 - 1.8	5.2E-01	5.6E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL, BBK
	7440-22-4	Silver	5.5E-02 J	1.7E-01 J	MG/KG	IR15-SS05-00-01-09C	3/16	0.27 - 1.8	1.7E-01	1.4E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	6.7E+00 J	6.9E+01 J	MG/KG	IR15-SS03D-00-01-09C	5/10	188 - 227	6.9E+01	8.1E+01	N/A	N/A		NO	NUT, BBK
	7440-28-0	Thallium	ND	ND	MG/KG		0/10	2.3 - 2.7	2.7E+00	3.6E-01	N/A	N/A		NO	NTX
	7440-62-2	Vanadium	2.2E+00 J	2.2E+01	MG/KG	IR15-SS03D-00-01-09C	10/10	3.8 - 4.5	2.2E+01	8.9E+00	3.9E+01 N	N/A		NO	BSL
	7440-66-6	Zinc	6.0E+00	1.7E+02	MG/KG	IR15-SS01-00-01-09C	7/10	3.8 - 4.5	1.7E+02	1.1E+01	2.4E+03 N	1.2E+03	NCPSRG	NO	BSL



Table 2.4  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
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[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background surface soil concentrations.

Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for n-Hexane used as surrogate for Methylcyclohexane.

RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for 2-Nitroaniline used as surrogate for 3-Nitroaniline.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Was detected, and other carcinogenic PAHs that were detected were identified as COPCs (cPAH)

Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

D = Compound identified in an analysis at a secondary dilution factor

J = Estimated Value

J- = Analyte present. Value may be biased low, actual value may be higher.

P = Difference between the concentration on the two columns is greater than 20%

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable

ND = Non-detect

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),

Csat used as screening level.



**TABLE 2.4a**

Risk Ratio Screening for Surface Soil, Maximum Detected Concentration  
 Camp Johnson Site 15  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Semi-volatile Organic Compounds (mg/kg)</b>								
Chrysene	2 / 15	2.2E-02 J	SWMU46-SM01-0-1	1.5E+01	1E-06	NA	1E-09	NA
Dibenz(a,h)anthracene	1 / 15	6.4E-02 J	IR15-SS03D-00-01-09C	1.5E-02	1E-06	NA	4E-06	NA
Indeno(1,2,3-cd)pyrene	1 / 15	5.2E-02 J	IR15-SS03D-00-01-09C	1.5E-01	1E-06	NA	3E-07	NA
<b>Polychlorinated Biphenyls (mg/kg)</b>								
Aroclor-1254	1 / 15	3.6E-01 J	IR15-SS01-00-01-09C	1.1E-01	1E-06	NA	3E-06	NA
<b>Metals (mg/kg)</b>								
Aluminum	10 / 10	1.3E+04	IR15-SS03-00-01-09C	7.7E+04	1	0.2	NA	Neurological, Developmental
Arsenic	16 / 16	4.7E+00	IR15-SS03D-00-01-09C	3.9E-01	1E-06	NA	1E-05	NA
Chromium	16 / 16	1.7E+01	IR15-SS03D-00-01-09C	2.9E-01	1E-06	NA	6E-05	NA
Iron	10 / 10	1.0E+04	IR15-SS03D-00-01-09C	5.5E+04	1	0.2	NA	Gastrointestinal
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>0.3</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>8E-05</b>	
							Total Developmental HI =	0.2
							Total Gastrointestinal HI =	0.2
							Total Neurological HI =	0.2

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

mg/kg = milligrams per kilogram

NA = Not available/not applicable



**TABLE 2.4b**

Risk Ratio Screening for Surface Soil, 95% UCL Concentration  
 Camp Johnson Site 15  
 MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL		95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte									
Semi-volatile Organic Compounds (mg/kg)									
Chrysene	2 / 15	2.2E-02	7	Max	1.5E+01	1E-06	NA	1E-09	NA
Dibenz(a,h)anthracene	1 / 15	6.4E-02	6	Max	1.5E-02	1E-06	NA	4E-06	NA
Indeno(1,2,3-cd)pyrene	1 / 15	5.2E-02	6	Max	1.5E-01	1E-06	NA	3E-07	NA
Polychlorinated Biphenyls (mg/kg)									
Aroclor-1254	1 / 15	3.6E-01	6	Max	1.1E-01	1E-06	NA	3E-06	NA
Metals (mg/kg)									
Arsenic	16 / 16	2.1E+00	1, 3	95% App-G	3.9E-01	1E-06	NA	5E-06	NA
Chromium	16 / 16	7.7E+00	1, 3	95% App-G	2.9E-01	1E-06	NA	3E-05	NA
Cumulative Corresponding Hazard Index <sup>c</sup>							NA		
Cumulative Corresponding Cancer Risk <sup>d</sup>								4E-05	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010, ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Approximate Gamma UCL (95% App-G); Maximum detected concentration (Max)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.
- (6) Only detected in one sample, detected concentration used.
- (7) Only detected in 2 samples, and not a significant contributor to risk at maximum detected concentration



Table 2.5  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
Site 15	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR15-SB07-2-4-09C	0/20	0.0016 - 0.0091	9.1E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.1E+00 C	N/A	NCPSRG	NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	1.9E-03 J	2.5E-03 J	MG/KG		4/21	0.0016 - 0.0091	2.5E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	BSL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	YES	DLASL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG	IR15-SB07-2-4-09C	0/20	0.0016 - 0.0091	9.1E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	9.0E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	1.3E-03 J	1.6E-03 J	MG/KG		3/21	0.0016 - 0.0091	1.6E-03	N/A	2.4E+00 C	N/A	NCPSRG	NO	BSL
	106-46-7	1,4-Dichlorobenzene	1.4E-03 J	1.6E-03 J	MG/KG		2/21	0.0016 - 0.0091	1.6E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	BSL
	78-93-3	2-Butanone	4.4E-03 J	4.0E-02 J	MG/KG		10/21	0.0031 - 0.018	4.0E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	6.0E-04 J	4.1E-03 J	MG/KG		2/21	0.0031 - 0.018	4.1E-03	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	BSL
	108-10-1	4-Methyl-2-pentanone	1.7E-03 J	1.7E-03 J	MG/KG		1/21	0.0031 - 0.018	1.7E-03	N/A	5.3E+02 N	N/A	NCPSRG	NO	BSL
	67-64-1	Acetone	4.6E-03	1.7E+00 J	MG/KG		21/23	0.0031 - 0.036	1.7E+00	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	4.2E-04 J	9.7E-04 J	MG/KG		2/21	0.0016 - 0.0091	9.7E-04	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	BSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG	IR15-SB04-2-7-09C	0/20	0.0016 - 0.0091	9.1E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/17	0.0032 - 0.012	1.2E-02	N/A	7.3E-01 N	N/A	NCPSRG	NO	DLBSL
	75-15-0	Carbon disulfide	1.4E-03 J	1.4E-03 J	MG/KG		1/20	0.0016 - 0.0091	1.4E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	BSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	2.6E-03 J	2.6E-03 J	MG/KG		1/21	0.0016 - 0.0091	2.6E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	BSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/19	0.0032 - 0.014	1.4E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	5.2E-03 J	5.2E-03 J	MG/KG		1/20	0.0016 - 0.0091	5.2E-03	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	BSL
	74-87-3	Chloromethane	ND	ND	MG/KG		0/20	0.0031 - 0.014	1.4E-02	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG	IR15-SS01-00-01-09C	0/20	0.0016 - 0.0091	9.1E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	110-82-7	Cyclohexane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.2E+02 NS	N/A	NCPSRG	NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL
	98-82-8	Isopropylbenzene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	DLBSL
	79-20-9	Methyl acetate	3.5E-03 J	2.1E+00	MG/KG		7/21	0.0016 - 0.72	2.1E+00	N/A	7.8E+03 N	N/A	NCPSRG	NO	BSL



Table 2.5  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Deletion or Selection
	108-87-2	Methylcyclohexane	ND	ND	MG/KG	IR15-SB05-2-7-09C	0/20	0.0016 - 0.0091	9.1E-03	N/A	N/A	N/A		NO	NTX
	75-09-2	Methylene chloride	2.9E-03 J	8.9E-03 J	MG/KG		4/20	0.0031 - 0.014	8.9E-03	N/A	1.1E+01 C	2.3E-02	NCPSRG	NO	BSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	4.3E+01 C	8.5E-02	NCPSRG	NO	DLBSL
	100-42-5	Styrene	2.6E-03 J	2.9E-03 J	MG/KG	IR15-SB07-2-4-09C	2/21	0.0016 - 0.0091	2.9E-03	N/A	6.3E+02 N	9.2E-01	NCPSRG	NO	BSL
	127-18-4	Tetrachloroethene	1.5E-03 J	1.5E-03 J	MG/KG	IR15-SB09-2-7-09C	1/21	0.0016 - 0.0091	1.5E-03	N/A	5.5E-01 C	5.0E-03	NCPSRG	NO	BSL
	108-88-3	Toluene	4.2E-04 J	1.0E-02 J	MG/KG	IR15-SS08-00-01-09C	4/21	0.0016 - 0.0091	1.0E-02	N/A	5.0E+02 N	5.5E+00	NCPSRG	NO	BSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.5E+01 N	5.1E-01	NCPSRG	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	2.8E+00 C	1.8E-02	NCPSRG	NO	DLBSL
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	7.9E+01 N	2.4E+01	NCPSRG	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/20	0.0031 - 0.014	1.4E-02	N/A	6.0E-02 C	1.9E-04	NCPSRG	NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/20	0.0016 - 0.0091	9.1E-03	N/A	6.3E+01 N	6.0E+00	NCPSRG	NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.1E+02 NS	4.3E+01	NCPSRG	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	88-06-2	2,4,6-Trichlorophenol	ND	ND	MG/KG		0/5	0.36 - 0.4	4.0E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.9E+01 N	4.1E-03	NCPSRG	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.1E+01 N	1.6E+00	NCPSRG	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	m&pCRESOL	3- and 4-Methylphenol	ND	ND	MG/KG		0/5	0.73 - 0.8	8.0E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	6.1E-01 N	N/A		YES	DLASL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/20	0.17 - 0.21	2.1E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL



Table 2.5  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.4E+02 N	8.4E+00	NCPSRG	NO	DLBSL
	208-96-8	Acenaphthylene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/16	0.17 - 1	1.0E+00	N/A	7.8E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/25	0.035 - 0.4	4.0E-01	N/A	1.5E-01 C	1.8E-01	NCPSRG	YES	DLASL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/25	0.035 - 0.4	4.0E-01	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/25	0.035 - 0.4	4.0E-01	N/A	1.5E-01 C	6.0E-01	NCPSRG	YES	DLASL
	191-24-2	Benzo(g,h,i)perylene	9.5E-02 J	9.5E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/25	0.17 - 0.4	9.5E-02	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	BSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	3.1E-02 J	1.8E-01 J	MG/KG	IR15-SS01-00-01-09C	6/25	0.17 - 0.4	1.8E-01	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	1.9E-01 J	1.9E-01 J	MG/KG	IR15-SS01-00-01-09C	1/25	0.17 - 0.4	1.9E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	BSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/24	0.17 - 1	1.0E+00	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	1.5E-02 J	2.2E-02 J	MG/KG	SWMU46-SM01-0-1	2/25	0.17 - 0.4	2.2E-02	N/A	1.5E+01 C	1.8E+01	NCPSRG	YES	CPAH
	53-70-3	Dibenz(a,h)anthracene	6.4E-02 J	6.4E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/25	0.035 - 0.4	6.4E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	ASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	5.0E-02 J	1.5E-01 J	MG/KG	IR15-SS10-00-01-09C	6/25	0.17 - 0.4	1.5E-01	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	BSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	YES	DLASL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	3.7E+01 N	N/A		NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	5.2E-02 J	5.2E-02 J	MG/KG	IR15-SS03D-00-01-09C	1/25	0.035 - 0.4	5.2E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	YES	CPAH
	78-59-1	Isophorone	ND	ND	MG/KG		0/25	0.035 - 0.4	4.0E-01	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/25	0.035 - 0.4	4.0E-01	N/A	6.9E-02 C	N/A		YES	DLASL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	9.9E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL



Table 2.5  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/25	0.17 - 1	1.0E+00	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/25	0.17 - 0.4	4.0E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL
	108-95-2	Phenol	ND	ND	MG/KG		0/25	0.17 - 0.4	1.8E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/25	0.17 - 0.4	1.8E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	5.8E-04 J	4.6E-02	MG/KG	IR15-SB10-2-4-09C	9/25	0.0017 - 0.009	1.8E-01	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	BSL
	72-55-9	4,4'-DDE	5.6E-04 J	9.5E-02	MG/KG	IR15-SB10-2-4-09C	17/25	0.0017 - 0.009	1.8E-01	N/A	1.4E+00 C	N/A	NCPSRG	NO	BSL
	50-29-3	4,4'-DDT	3.9E-04 J	1.8E-01	MG/KG	IR15-SB10-2-4-09C	14/25	0.0017 - 0.018	1.8E-01	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	2.9E-02 C*	N/A	NCPSRG	NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	1.0E-03 J	9.9E-03 J	MG/KG	IR15-SB10-2-4-09C	5/25	0.0017 - 0.0021	9.9E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	3.9E-01 N	N/A	NCPSRG	NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	1.4E-01 C	N/A	NCPSRG	NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	1.4E-01 C	N/A	NCPSRG	NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A	NCPSRG	NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A	NCPSRG	NO	DLBSL
	<b>11097-69-1</b>	<b>Aroclor-1254</b>	<b>3.6E-01 J</b>	<b>3.6E-01 J</b>	<b>MG/KG</b>	<b>IR15-SS01-00-01-09C</b>	<b>1/25</b>	<b>0.017 - 0.021</b>	<b>3.6E-01</b>	<b>N/A</b>	<b>1.1E-01 C**</b>	<b>N/A</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	11096-82-5	Aroclor-1260	ND	ND	MG/KG		0/25	0.017 - 0.021	2.1E-02	N/A	2.2E-01 C	N/A	NCPSRG	NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	60-57-1	Dieldrin	9.1E-04 J	2.3E-03	MG/KG	IR15-SB05-2-7-09C	3/25	0.0017 - 0.0021	2.3E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	BSL
	959-98-8	Endosulfan I	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	1.1E-03 JP	1.1E-03 JP	MG/KG	SWMU46-SM01-0-1	1/25	0.0017 - 0.0021	1.1E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	BSL
	1031-07-8	Endosulfan sulfate	1.6E-02 P	3.8E-02 D	MG/KG	SWMU46-SM03-0-1	4/25	0.0017 - 0.0037	3.8E-02	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	BSL
	72-20-8	Endrin	1.7E-03 JP	1.7E-03 JP	MG/KG	SWMU46-SM01-0-1	1/25	0.0017 - 0.0021	1.7E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	BSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	3.8E-03 P	1.8E-02 P	MG/KG	SWMU46-SM05-0-1	4/25	0.0017 - 0.0021	1.8E-02	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	BSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	5.8E-04 J	8.6E-03 J	MG/KG	IR15-SS01-00-01-09C	5/25	0.0017 - 0.0021	8.6E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	76-44-8	Heptachlor	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/25	0.0017 - 0.0021	2.1E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	4.6E-03 J	4.6E-03 J	MG/KG	SWMU46-SM01-0-1	1/25	0.0017 - 0.008	4.6E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	BSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/25	0.035 - 0.1	1.0E-01	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	<b>7429-90-5</b>	<b>Aluminum</b>	<b>4.6E+02</b>	<b>1.3E+04</b>	<b>MG/KG</b>	<b>IR15-SS03-00-01-09C</b>	<b>20/20</b>	<b>75.3 - 430</b>	<b>1.3E+04</b>	<b>5.5E+03</b>	<b>7.7E+03 N</b>	<b>N/A</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-36-0	Antimony	2.1E-01 J-	8.2E-01 J-	MG/KG	IR15-SB01-4-6-09C	6/20	1.5 - 8.6	8.2E-01	3.6E-01	3.1E+00 N	N/A	NCPSRG	NO	BSL
	<b>7440-38-2</b>	<b>Arsenic</b>	<b>2.4E-01 J</b>	<b>1.7E+01</b>	<b>MG/KG</b>	<b>IR15-SB09-2-7-09C</b>	<b>25/26</b>	<b>0.27 - 8.6</b>	<b>1.7E+01</b>	<b>6.3E-01</b>	<b>3.9E-01 C*</b>	<b>5.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-39-3	Barium	2.9E+00 J	3.4E+01	MG/KG	IR15-SS01-00-01-09C	24/26	1.4 - 21.5	3.4E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	3.9E-02 J	1.4E-01 J	MG/KG	IR15-SS03-00-01-09C	9/20	0.15 - 0.86	1.4E-01	1.0E-01	1.6E+01 N	N/A	NCPSRG	NO	BSL



Table 2.5  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
 Camp Johnson Site 15  
 MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
 Medium: Surface and Subsurface Soil  
 Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-43-9	Cadmium	1.4E-02 J	8.2E-01 J	MG/KG	IR15-SB09-2-7-09C	11/26	0.11 - 2.6	8.2E-01	2.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL
	7440-70-2	Calcium	9.4E+01	3.7E+04	MG/KG	IR15-SS01-00-01-09C	18/20	75.3 - 430	3.7E+04	4.4E+02	N/A	N/A		NO	NUT
	7440-47-3	Chromium	1.1E+00 J	5.2E+01 J	MG/KG	IR15-SB09-2-7-09C	26/26	0.27 - 8.6	5.2E+01	6.1E+00	2.9E-01 C	3.8E+00	NCPSRG	YES	ASL
	7440-48-4	Cobalt	6.6E-02 J	9.3E+00	MG/KG	IR15-SB09-2-7-09C	17/20	0.38 - 4.5	9.3E+00	2.9E-01	2.3E+00 N	N/A		YES	ASL
	7440-50-8	Copper	2.7E-01 J	4.2E+01	MG/KG	IR15-SS01-00-01-09C	19/20	1.5 - 8.6	4.2E+01	2.6E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	7439-89-6	Iron	1.5E+02 J+	1.8E+05 J+	MG/KG	IR15-SB09-2-7-09C	20/20	11.3 - 64.5	1.8E+05	3.2E+03	5.5E+03 N	1.5E+02	NCPSRG	YES	ASL
	7439-92-1	Lead	1.3E+00 J	4.8E+02	MG/KG	IR15-SB01-4-6-09C	26/26	0.27 - 8.6	4.8E+02	8.5E+00	4.0E+02 NL	2.7E+02	NCPSRG	YES	ASL
	7439-95-4	Magnesium	1.7E+01 J	8.0E+02	MG/KG	IR15-SS03D-00-01-09C	20/20	18.8 - 108	8.0E+02	2.4E+02	N/A	N/A		NO	NUT
	7439-96-5	Manganese	1.5E+00	6.3E+02	MG/KG	IR15-SB09-2-7-09C	20/20	0.38 - 2.2	6.3E+02	9.3E+00	1.8E+02 N	6.5E+01	NCPSRG	YES	ASL
	7439-97-6	Mercury	2.7E-03 J	5.1E-01	MG/KG	IR15-SS01-00-01-09C	12/25	0.033 - 0.1	5.1E-01	7.1E-02	2.3E+00 N	1.0E+00	NCPSRG	NO	BSL
	7440-02-0	Nickel	4.8E-01 J	2.4E+01	MG/KG	IR15-SB09-2-7-09C	18/20	0.75 - 4.3	2.4E+01	1.2E+00	1.6E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	1.8E+01 J	5.0E+02	MG/KG	IR15-SS03-00-01-09C	17/20	75.3 - 430	5.0E+02	1.2E+02	N/A	N/A		NO	NUT
	7782-49-2	Selenium	2.0E-01 J	5.2E-01	MG/KG	SWMU46-SM08-0-1	7/26	0.27 - 8.6	5.2E-01	5.1E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL
	7440-22-4	Silver	5.5E-02 J	1.7E-01 J	MG/KG	IR15-SS05-00-01-09C	3/26	0.27 - 8.6	1.7E-01	1.3E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	4.3E+00 J	6.9E+01 J	MG/KG	IR15-SS03D-00-01-09C	11/20	188 - 1080	6.9E+01	6.8E+01	N/A	N/A		NO	NUT
	7440-28-0	Thallium	1.9E+00 J	1.9E+00 J	MG/KG	IR15-SB09-2-7-09C	1/20	2.3 - 12.9	1.9E+00	3.6E-01	N/A	N/A		NO	NTX
	7440-62-2	Vanadium	2.2E+00 J	2.2E+01	MG/KG	IR15-SS03D-00-01-09C	18/20	3.8 - 21.5	2.2E+01	8.9E+00	3.9E+01 N	N/A		NO	BSL
	7440-66-6	Zinc	1.5E+00 J	3.5E+02	MG/KG	IR15-SB01-4-6-09C	13/20	3.8 - 21.5	3.5E+02	6.6E+00	2.4E+03 N	1.2E+03	NCPSRG	NO	BSL



Table 2.5  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
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[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.

Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason:

Above Screening Levels (ASL)

Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA

Was detected, and other carcinogenic PAHs that were detected were identified as COPCs (cPAH)

Deletion Reason:

No Toxicity Information (NTX)

Essential Nutrient (NUT)

Below Screening Level (BSL)

Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

D = Compound identified in an analysis at a secondary dilution factor

J = Estimated Value

J+ = Analyte present, value may be biased high, actual value may be lower

P = Difference between the concentration on the two columns is greater than 20%

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available

ND = Non-detect

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),

Csat used as screening level.



**TABLE 2.5a**

Risk Ratio Screening for Surface and Subsurface Soil, Maximum Detected Concentration  
 Camp Johnson Site 15  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Semi-volatile Organic Compounds (mg/kg)</b>								
Chrysene	2 / 25	2.2E-02 J	SWMU46-SM01-0-1	1.5E+01	1E-06	NA	1E-09	NA
Dibenz(a,h)anthracene	1 / 25	6.4E-02 J	IR15-SS03D-00-01-09C	1.5E-02	1E-06	NA	4E-06	NA
Indeno(1,2,3-cd)pyrene	1 / 25	5.2E-02 J	IR15-SS03D-00-01-09C	1.5E-01	1E-06	NA	3E-07	NA
<b>Polychlorinated Biphenyls (mg/kg)</b>								
Aroclor-1254	1 / 25	3.6E-01 J	IR15-SS01-00-01-09C	1.1E-01	1E-06	NA	3E-06	NA
<b>Metals (mg/kg)</b>								
Aluminum	20 / 20	1.3E+04	IR15-SS03-00-01-09C	7.7E+04	1	0.2	NA	Neurological, Developmental
Arsenic	25 / 26	1.7E+01	IR15-SB09-2-7-09C	3.9E-01	1E-06	NA	4E-05	NA
Chromium	26 / 26	5.2E+01 J	IR15-SB09-2-7-09C	2.9E-01	1E-06	NA	2E-04	NA
Cobalt	17 / 20	9.3E+00	IR15-SB09-2-7-09C	2.3E+01	1E+00	0.4	NA	Thyroid
Iron	20 / 20	1.8E+05 J+	IR15-SB09-2-7-09C	5.5E+04	1	3.3	NA	Gastrointestinal
Lead	26 / 26	4.8E+02	IR15-SB01-4-6-09C	NA		NA		
Manganese	20 / 20	6.3E+02	IR15-SB09-2-7-09C	1.8E+03	1	0.3	NA	Central Nervous System
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>4.2</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>2E-04</b>	
Total Developmental HI =							0.2	
Total Gastrointestinal HI =							3.3	
Total Nervous System HI =							0.5	
Total Thyroid HI =							0.4	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

J+ = Analyte present, value may be biased high, actual value may be lower

mg/kg = milligrams per kilogram

NA = Not available/not applicable



**TABLE 2.5b**

Risk Ratio Screening for Surface and Subsurface Soil, 95% UCL Concentration

Camp Johnson Site 15

MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL		95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte									
Semi-volatile Organic Compounds (mg/kg)									
Chrysene	2 / 25	2.2E-02	4, 5	Max	1.5E+01	1E-06	NA	1E-09	NA
Dibenz(a,h)anthracene	1 / 25	6.4E-02	6	Max	1.5E-02	1E-06	NA	4E-06	NA
Indeno(1,2,3-cd)pyrene	1 / 25	5.2E-02	6	Max	1.5E-01	1E-06	NA	3E-07	NA
Polychlorinated Biphenyls (mg/kg)									
Aroclor-1254	1 / 25	3.6E-01	6	Max	1.1E-01	1E-06	NA	3E-06	NA
Metals (mg/kg)									
Arsenic	25 / 26	4.7E+00	1	95% KM-c	3.9E-01	1E-06	NA	1E-05	NA
Chromium	26 / 26	9.9E+00	1	95% H	2.9E-01	1E-06	NA	3E-05	NA
Iron	20 / 20	5.0E+04	1	95% Cheb-m	5.5E+04	1	0.9	NA	Gastrointestinal
Lead	26 / 26	3.6E+01	7	Mean	NA		NA	NA	NA
Cumulative Corresponding Hazard Index <sup>c</sup>							0.9		
Cumulative Corresponding Cancer Risk <sup>d</sup>								5E-05	
Total Gastrointestinal HI =								0.9	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations

in users guide (USEPA, May 2010, ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Kaplan-Meier (Chebyshev) UCL (95% KM-c); 95% H UCL (95% H); 95% Chebyshev (MVUE) UCL (95% Cheb); 95% Chebyshev (Mean, Sd) UCL (95% Cheb-m);

Maximum detected concentration (Max); Arithmetic Mean (Mean)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors test indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.
- (6) Only detected in one sample, detected concentration used.
- (7) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Site 15	71-55-6	1,1,1-Trichloroethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	9.1E+02 N	2.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	UG/L		0/4	1 - 2.4	2.4E+00	N/A	6.7E-02 C	2.0E-01	15A NCAC 2L	YES	DLASL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	5.9E+03 N	2.0E+05	15A NCAC 2L	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	2.4E-01 C	5.0E+00	MCL	YES	DLASL
	75-34-3	1,1-Dichloroethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	2.4E+00 C	6.0E+00	15A NCAC 2L	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	3.4E+01 N	7.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.1E-01 C**	7.0E+01	MCL, 15A NCAC 2L	YES	DLASL
	106-93-4	1,2-Dibromoethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	6.5E-03 C	5.0E-02	MCL	YES	DLASL
												2.0E-02	15A NCAC 2L		
	95-50-1	1,2-Dichlorobenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	3.7E+01 N	6.0E+02	MCL	NO	DLBSL
												2.0E+01	15A NCAC 2L		
	107-06-2	1,2-Dichloroethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.5E-01 C	5.0E+00	MCL	YES	DLASL
												4.0E-01	15A NCAC 2L		
	78-87-5	1,2-Dichloropropane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	3.9E-01 C*	5.0E+00	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	541-73-1	1,3-Dichlorobenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.3E-01 C	2.0E+02	15A NCAC 2L	YES	DLASL
	106-46-7	1,4-Dichlorobenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.3E-01 C	7.5E+01	MCL	YES	DLASL
												6.0E+00	15A NCAC 2L		
	78-93-3	2-Butanone	ND	ND	UG/L		0/4	5 - 5	5.0E+00	N/A	7.1E+02 N	4.0E+03	15A NCAC 2L	NO	DLBSL
	591-78-6	2-Hexanone	ND	ND	UG/L		0/4	5 - 5	5.0E+00	N/A	4.7E+00 N	N/A		YES	DLASL
	108-10-1	4-Methyl-2-pentanone	ND	ND	UG/L		0/4	5 - 5	5.0E+00	N/A	2.0E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	ND	ND	UG/L		0/4	5 - 5	5.0E+00	N/A	2.2E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	71-43-2	Benzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.1E-01 C	5.0E+00	MCL	YES	DLASL
												1.0E+00	15A NCAC 2L		
	75-27-4	Bromodichloromethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.2E-01 C	8.0E+01	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	75-25-2	Bromoform	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	8.5E+00 C*	8.0E+01	MCL	NO	DLBSL
												4.0E+00	15A NCAC 2L		
	74-83-9	Bromomethane	ND	ND	UG/L		0/4	1.1 - 1.1	1.1E+00	N/A	8.7E-01 N	N/A		YES	DLASL
	75-15-0	Carbon disulfide	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.0E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.4E-01 C	5.0E+00	MCL	YES	DLASL
												3.0E-01	15A NCAC 2L		
	108-90-7	Chlorobenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	9.1E+00 N	1.0E+02	MCL	NO	DLBSL
												5.0E+01	15A NCAC 2L		
	75-00-3	Chloroethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	2.1E+03 N	3.0E+03	15A NCAC 2L	NO	DLBSL
	67-66-3	Chloroform	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.9E-01 C	8.0E+01	MCL	YES	DLASL
												7.0E+01	15A NCAC 2L		



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	74-87-3	Chloromethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.9E+01 N	3.0E+00	15A NCAC 2L	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	3.7E+01 N	7.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	110-82-7	Cyclohexane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.3E+03 N	N/A		NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.5E-01 C	6.0E+01	MCL	YES	DLASL
												4.0E-01	15A NCAC 2L		
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.0E+01 N	1.0E+03	15A NCAC 2L	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.5E+00 C	7.0E+02	MCL	NO	DLBSL
												6.0E+02	15A NCAC 2L		
	98-82-8	Isopropylbenzene	4.9E+00 J	4.9E+00 J	UG/L	IR15-TW03D-09C	1/4	1 - 1	4.9E+00	N/A	6.8E+01 N	7.0E+01	15A NCAC 2L	NO	BSL
	79-20-9	Methyl acetate	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	3.7E+03 N	N/A		NO	DLBSL
	108-87-2	Methylcyclohexane	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	N/A	N/A		NO	NTX
	75-09-2	Methylene chloride	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.8E+00 C	5.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.3E+01 C	2.0E+01	15A NCAC 2L	NO	DLBSL
	100-42-5	Styrene	5.9E+00 J	5.9E+00 J	UG/L	IR15-TW03D-09C	1/4	1 - 1	5.9E+00	N/A	1.6E+02 N	1.0E+02	MCL	NO	BSL
												7.0E+01	15A NCAC 2L		
	127-18-4	Tetrachloroethene	ND	ND	UG/L		0/4	1.1 - 1.1	1.1E+00	N/A	1.1E-01 C	5.0E+00	MCL	YES	DLASL
												7.0E-01	15A NCAC 2L		
	108-88-3	Toluene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	2.3E+02 N	1.0E+03	MCL	NO	DLBSL
												6.0E+02	15A NCAC 2L		
	156-60-5	trans-1,2-Dichloroethene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.1E+01 N	1.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	79-01-6	Trichloroethene	ND	ND	UG/L		0/4	5.1 - 5.1	5.1E+00	N/A	2.0E+00 C	5.0E+00	MCL	YES	DLASL
												3.0E+00	15A NCAC 2L		
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.3E+02 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	UG/L		0/4	1 - 1	1.0E+00	N/A	1.6E-02 C	2.0E+00	MCL	YES	DLASL
												3.0E-02	15A NCAC 2L		
	1330-20-7	Xylene, total	ND	ND	UG/L		0/4	1.2 - 1.2	1.2E+00	N/A	2.0E+01 N	1.0E+04	MCL	NO	DLBSL
												5.0E+02	15A NCAC 2L		
	92-52-4	1,1-Biphenyl	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+02 N	4.0E+02		NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.2E-01 C	N/A		YES	DLASL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	7.3E+01 N	1.0E+02	15A NCAC 2L	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	7.3E+00 N	N/A		YES	DLASL
	121-14-2	2,4-Dinitrotoluene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.2E-01 C	N/A		YES	DLASL
	606-20-2	2,6-Dinitrotoluene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	91-58-7	2-Chloronaphthalene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.9E+02 N	N/A		NO	DLBSL



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	95-57-8	2-Chlorophenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+01 N	4.0E-01	15A NCAC 2L	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.5E+01 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	1.5E-01 C	N/A		YES	DLASL
	99-09-2	3-Nitroaniline	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	3.7E-01 N	N/A		YES	DLASL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.4E-01 C	N/A		YES	DLASL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	1.8E+01 N	4.0E+01	15A NCAC 2L	YES	DLASL
	100-01-6	4-Nitroaniline	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.4E+00 C*	N/A		YES	DLASL
	100-02-7	4-Nitrophenol	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	83-32-9	Acenaphthene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.2E+02 N	8.0E+01	15A NCAC 2L	NO	DLBSL
	208-96-8	Acenaphthylene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.2E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+03 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	2.9E-01 C	3.0E+00	MCL, 15A NCAC 2L	YES	DLASL
	56-55-3	Benzo(a)anthracene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	50-32-8	Benzo(a)pyrene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-03 C	2.0E-01	MCL	YES	DLASL
												5.0E-03	15A NCAC 2L		
	205-99-2	Benzo(b)fluoranthene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-01 C	5.0E-01	15A NCAC 2L	YES	DLASL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+01 N	N/A		YES	DLASL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.2E-02 C	3.0E-02	15A NCAC 2L	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	4.8E+00 C	6.0E+00	MCL	YES	DLASL
												3.0E+00	15A NCAC 2L		
	85-68-7	Butylbenzylphthalate	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.5E+01 C	1.0E+03	15A NCAC 2L	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.8E+03 N	4.0E+03	15A NCAC 2L	NO	DLBSL
	86-74-8	Carbazole	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E+00 C	5.0E+00	15A NCAC 2L	YES	DLASL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-03 C	5.0E-03	15A NCAC 2L	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	84-66-2	Diethylphthalate	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.9E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	84-74-2	Di-n-butylphthalate	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	3.7E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	117-84-0	Di-n-octylphthalate	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	4.8E+00 C	1.0E+02	15A NCAC 2L	YES	DLASL
	206-44-0	Fluoranthene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	86-73-7	Fluorene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	4.2E-02 C	1.0E+00	MCL	YES	DLASL
												2.0E-02	15A NCAC 2L		
	87-68-3	Hexachlorobutadiene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	8.6E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	2.2E+01 N	5.0E+01	MCL	NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.7E+00 C**	N/A		YES	DLASL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	3.0E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	78-59-1	Isophorone	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	7.1E+01 C	4.0E+01	15A NCAC 2L	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.4E-01 C*	6.0E+00	15A NCAC 2L	YES	DLASL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	9.6E-03 C	N/A		YES	DLASL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.4E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	87-86-5	Pentachlorophenol	ND	ND	UG/L		0/3	20 - 22	2.2E+01	N/A	5.6E-01 C	1.0E+00	MCL	YES	DLASL
												3.0E-01	15A NCAC 2L		
	85-01-8	Phenanthrene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+03 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	108-95-2	Phenol	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+03 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	129-00-0	Pyrene	ND	ND	UG/L		0/3	10 - 11	1.1E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	72-54-8	4,4'-DDD	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.8E-01 C	1.0E-01	15A NCAC 2L	NO	DLBSL
	72-55-9	4,4'-DDE	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.0E-01 C	N/A		NO	DLBSL
	50-29-3	4,4'-DDT	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.0E-01 C*	1.0E-01	15A NCAC 2L	NO	DLBSL
	309-00-2	Aldrin	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	4.0E-03 C	N/A		YES	DLASL
	319-84-6	alpha-BHC	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.1E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	5103-71-9	alpha-Chlordane	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.9E-01 C*	2.0E+00	MCL	NO	DLBSL
												1.0E-01	15A NCAC 2L		
	12674-11-2	Aroclor-1016	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	2.6E-01 C**	5.0E-01	MCL	YES	DLASL
	11104-28-2	Aroclor-1221	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	11141-16-5	Aroclor-1232	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	53469-21-9	Aroclor-1242	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	12672-29-6	Aroclor-1248	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	11097-69-1	Aroclor-1254	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	3.4E-02 C*	5.0E-01	MCL	YES	DLASL
	11096-82-5	Aroclor-1260	ND	ND	UG/L		0/3	0.51 - 0.53	5.3E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	319-85-7	beta-BHC	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	319-86-8	delta-BHC	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	60-57-1	Dieldrin	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	4.2E-03 C	2.0E-03	15A NCAC 2L	YES	DLASL
	959-98-8	Endosulfan I	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	1031-07-8	Endosulfan sulfate	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	72-20-8	Endrin	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.1E+00 N	2.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	6.1E-02 C	2.0E-01	MCL	NO	DLBSL
												3.0E-02	15A NCAC 2L		
	5103-74-2	gamma-Chlordane	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.9E-01 C*	2.0E+00	MCL	NO	DLBSL
												1.0E-01	15A NCAC 2L		
	76-44-8	Heptachlor	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.5E-02 C	4.0E-01	MCL	YES	DLASL
												8.0E-03	15A NCAC 2L		
	1024-57-3	Heptachlor epoxide	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	7.4E-03 C*	2.0E-01	MCL	YES	DLASL
												4.0E-03	15A NCAC 2L		
	72-43-5	Methoxychlor	ND	ND	UG/L		0/3	0.051 - 0.053	5.3E-02	N/A	1.8E+01 N	4.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	UG/L		0/3	1 - 1.1	1.1E+00	N/A	6.1E-02 C	3.0E+00	MCL	YES	DLASL
												3.0E-02	15A NCAC 2L		
	7429-90-5	Aluminum	4.6E+01 J	3.4E+03	UG/L	IR15-TW05-09C	5/5	1000 - 1000	3.4E+03	1.9E+03	3.7E+03 N	50 - 200	SMCL	NO	BSL
	7440-36-0	Antimony	ND	ND	UG/L		0/5	20 - 20	2.0E+01	3.3E+00	1.5E+00 N	6.0E+00	MCL	YES	DLASL
	7440-38-2	Arsenic	3.2E+00 J	3.2E+00 J	UG/L	IR15-TW04-09C	1/5	20 - 20	3.2E+00	5.8E+00	4.5E-02 C	1.0E+01	MCL, 15A NCAC 2L	NO	BBK
	7440-39-3	Barium	1.9E+01 J	9.5E+01	UG/L	IR15-TW03D-09C	5/5	20 - 50	9.5E+01	8.6E+01	7.3E+02 N	2.0E+03	MCL	NO	BSL
												7.0E+02	15A NCAC 2L		
	7440-41-7	Beryllium	1.8E-01 J	1.8E-01 J	UG/L	IR15-TW03D-09C	1/5	2 - 2	1.8E-01	3.1E-01	7.3E+00 N	4.0E+00	MCL	NO	BSL, BBK
	7440-43-9	Cadmium	ND	ND	UG/L		0/5	6 - 6	6.0E+00	3.6E-01	1.8E+00 N	5.0E+00	MCL	YES	DLASL
												2.0E+00	15A NCAC 2L		
	7440-70-2	Calcium	3.6E+03	4.6E+04	UG/L	IR15-TW04-09C	5/5	1000 - 1000	4.6E+04	6.9E+04	N/A	N/A		NO	NUT, BBK
	7440-47-3	Chromium	1.7E+00 J	5.0E+00 J	UG/L	IR15-TW05-09C	2/5	20 - 20	5.0E+00	3.1E+00	4.3E-02 C	1.0E+02	MCL	YES	ASL
												1.0E+01	15A NCAC 2L		
	7440-48-4	Cobalt	6.3E-01 J	3.9E+00 J	UG/L	IR15-TW01-09C	4/5	5 - 5	3.9E+00	3.4E+00	1.1E+00 N	N/A		YES	ASL
	7440-50-8	Copper	2.8E+00 J	3.8E+00 J	UG/L	IR15-TW05-09C	3/5	20 - 20	3.8E+00	2.8E+00	1.5E+02 N	1.3E+03	MCL	NO	BSL
												1.0E+03	15A NCAC 2L		
	7439-89-6	Iron	1.0E+03	2.6E+04	UG/L	IR15-TW01-09C	5/5	150 - 150	2.6E+04	6.0E+03	2.6E+03 N	3.0E+02	SMCL, 15A NCAC 2L	YES	ASL
	7439-92-1	Lead	ND	ND	UG/L		0/5	20 - 20	2.0E+01	2.8E+00	N/A	1.5E+01	MCL, 15A NCAC 2L	YES	DLASL
	7439-95-4	Magnesium	3.9E+02	4.6E+03	UG/L	IR15-TW03D-09C	5/5	250 - 250	4.6E+03	6.4E+03	N/A	N/A		NO	NUT, BBK
	7439-96-5	Manganese	5.2E+00	4.4E+02	UG/L	IR15-TW01-09C	5/5	5 - 5	4.4E+02	2.1E+02	8.8E+01 N	5.0E+01	SMCL, 15A NCAC 2L	YES	ASL
	7439-97-6	Mercury	ND	ND	UG/L		0/5	0.2 - 0.2	2.0E-01	1.0E-01	1.1E+00 N	2.0E+00	MCL	NO	DLBSL
												1.0E+00	15A NCAC 2L		
	7440-02-0	Nickel	2.3E+00 J	3.0E+01	UG/L	IR15-TW01-09C	4/5	10 - 10	3.0E+01	8.0E+00	7.3E+01 N	1.0E+02	15A NCAC 2L	NO	BSL
	7440-09-7	Potassium	6.2E+02 J	2.5E+03	UG/L	IR15-TW02-09C	5/5	1000 - 1000	2.5E+03	3.3E+03	N/A	N/A		NO	NUT, BBK
	7782-49-2	Selenium	ND	ND	UG/L		0/5	20 - 20	2.0E+01	3.1E+00	1.8E+01 N	5.0E+01	MCL	YES	DLASL
												2.0E+01	15A NCAC 2L		



Table 2.6  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 15  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-22-4	Silver	ND	ND	UG/L		0/5	20 - 20	2.0E+01	7.7E-01	1.8E+01 N	2.0E+01 1.0E+02	15A NCAC 2L SMCL	YES	DLASL
	7440-23-5	Sodium	1.6E+03 J	8.0E+03	UG/L	IR15-TW03D-09C	5/5	2500 - 2500	8.0E+03	2.3E+04	N/A	N/A		NO	NUT, BBK
	7440-28-0	Thallium	3.2E+00 J	3.2E+00 J	UG/L	IR15-TW04-09C	1/5	30 - 30	3.2E+00	3.8E+00	N/A	2.0E+00	MCL	NO	NTX, BBK
	7440-62-2	Vanadium	ND	ND	UG/L		0/5	50 - 50	5.0E+01	4.7E+00	1.8E+01 N	N/A		YES	DLASL
	7440-66-6	Zinc	5.3E+00 J	1.1E+01 J	UG/L	IR15-TW03-09C	5/5	50 - 50	1.1E+01	4.2E+01	1.1E+03 N	1.0E+03 5.0E+03	15A NCAC 2L SMCL	NO	BSL, BBK

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background shallow groundwater concentrations. Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL), May 17, 2010. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) tap water RSLs.

RSL value for 1,4-Dichlorobenzene used as surrogate for 1,3-Dichlorobenzene

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for 2-Nitroaniline used as surrogate for 3-Nitroaniline.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for chromium VI used for total chromium.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA

Deletion Reason: No Toxicity Information (NTX)

Essential Nutrient (NUT)

Below Screening Level (BSL)

Below Background (BBK)

Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/

To Be Considered

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards

SMCL = Secondary Maximum Contaminant Level

15A NCAC 2L = North Carolina Classifications and Groundwater Quality Standards,

January 2010.

J = Estimated Value

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

N = Noncarcinogenic

NA = Not available/not applicable

ND = Not detected

UG/L = Micrograms per liter



**TABLE 2.6a**

Risk Ratio Screening for Groundwater, Maximum Detected Concentration

Camp Johnson Site 15

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Metals (ug/L)								
Chromium	2 / 5	5.0E+00 J	IR15-TW05-09C	4.3E-02	1E-06	NA	1E-04	NA
Cobalt	4 / 5	3.9E+00 J	IR15-TW01-09C	1.1E+01	1	0.4		Thyroid
Iron	5 / 5	2.6E+04	IR15-TW01-09C	2.6E+04	1	1		Gastrointestinal
Manganese	5 / 5	4.4E+02	IR15-TW01-09C	8.8E+02	1	0.5		Central Nervous System
Cumulative Corresponding Hazard Index <sup>c</sup>						1.8		
Cumulative Corresponding Cancer Risk <sup>d</sup>							1E-04	
Total Gastrointestinal HI =								1.0
Total Central Nervous System HI =								0.5
Total Thyroid HI =								0.4

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

ug/L = micrograms per liter

NA = Not available/not applicable



**TABLE 2.6b**

Risk Ratio Screening for Groundwater, 95% UCL Concentration

Camp Johnson Site 15

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	95% UCL	95% UCL Rationale	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (ug/L)</b>								
<b>Chromium</b>	2 / 5	5.0E+00 Max	4, 5	4.5E-02	1E-06	NA	1E-04	NA
<b>Iron</b>	5 / 5	1.9E+04 95% Stud-t	1, 2, 3	2.6E+04	1	0.7	NA	Gastrointestinal
Cumulative Corresponding Hazard Index <sup>c</sup>						0.7		
Cumulative Corresponding Cancer Risk <sup>d</sup>							1E-04	
Total Gastrointestinal HI =								0.7

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05,

otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

NA = Not available/not applicable

ug/L = micrograms per liter

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010. ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: Maximum detected concentration (Max); 95% Student's-t UCL (95% Stud-t)

Upper Confidence Limit (UCL) Rationale:

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.

(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.

(3) Test indicates data are gamma distributed.

(4) Distribution tests are inconclusive

(5) Max value used because 95% UCL greater than max.

(6) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Table 2.7  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Site 17	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR17-SS04-00-01-09C	0/4	0.003 - 0.0065	6.5E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	1.1E+00 C	N/A		NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	DLBSL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	YES	DLASL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG	IR17-SS04-00-01-09C	0/4	0.003 - 0.0065	6.5E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	9.0E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.4E+00 C	N/A		NO	DLBSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	DLBSL
	78-93-3	2-Butanone	2.8E-03 J	2.3E-02 J	MG/KG		4/5	0.0061 - 0.013	2.3E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	ND	ND	MG/KG		0/4	0.0061 - 0.013	1.3E-02	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	DLBSL
	108-10-1	4-Methyl-2-pentanone	ND	ND	MG/KG		0/4	0.0061 - 0.013	1.3E-02	N/A	5.3E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	7.0E-02 J	9.0E-01 J	MG/KG		4/5	0.0061 - 0.013	9.0E-01	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	DLBSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/3	0.0092 - 0.011	1.1E-02	N/A	7.3E-01 N	N/A		NO	DLBSL
	75-15-0	Carbon disulfide	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	DLBSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/4	0.0061 - 0.013	1.3E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	1.3E-02 J	1.3E-02 J	MG/KG	IR17-SS02-00-01-09C	1/4	0.003 - 0.0065	1.3E-02	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	BSL
	74-87-3	Chloromethane	6.5E-03 J	6.5E-03 J	MG/KG	IR17-SS01-00-01-09C	1/4	0.0061 - 0.013	6.5E-03	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL	
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL	
	110-82-7	Cyclohexane	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	1.2E+02 NS	N/A		NO	DLBSL	
	124-48-1	Dibromochloromethane	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL	
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL	
	100-41-4	Ethylbenzene	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL	
	98-82-8	Isopropylbenzene	ND	ND	MG/KG	0/4	0.003 - 0.0065	6.5E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	DLBSL	
	79-20-9	Methyl acetate	3.6E-03 J	7.0E-02 J	MG/KG	IR17-SS04-00-01-09C	4/5	0.003 - 0.0065	7.0E-02	N/A	7.8E+03 N	N/A		NO	BSL



Table 2.7  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Deletion or Selection
	108-87-2	Methylcyclohexane	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	N/A	N/A		NO	NTX
	75-09-2	Methylene chloride	ND	ND	MG/KG		0/4	0.0061 - 0.013	1.3E-02	N/A	1.1E+01 C	2.3E-02	NCPSRG	NO	DLBSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	4.3E+01 C	8.5E-02	NCPSRG	NO	DLBSL
	100-42-5	Styrene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	6.3E+02 N	9.2E-01	NCPSRG	NO	DLBSL
	127-18-4	Tetrachloroethene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	5.5E-01 C	5.0E-03	NCPSRG	NO	DLBSL
	108-88-3	Toluene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	5.0E+02 N	5.5E+00	NCPSRG	NO	DLBSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	1.5E+01 N	5.1E-01	NCPSRG	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	2.8E+00 C	1.8E-02	NCPSRG	NO	DLBSL
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	7.9E+01 N	2.4E+01	NCPSRG	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/4	0.0061 - 0.013	1.3E-02	N/A	6.0E-02 C	1.9E-04	NCPSRG	NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/4	0.003 - 0.0065	6.5E-03	N/A	6.3E+01 N	6.0E+00	NCPSRG	NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.1E+02 NS	4.3E+01	NCPSRG	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.9E+01 N	4.1E-03	NCPSRG	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	1.6E+00	NCPSRG	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E-01 N	N/A		NO	DLBSL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.4E+02 N	8.4E+00	NCPSRG	NO	DLBSL



Table 2.7  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
 Camp Johnson Site 17  
 MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
 Medium: Surface Soil  
 Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Deletion or Selection
	208-96-8	Acenaphthylene	ND	ND	MG/KG	IR17-SS01-00-01-09C	0/5	0.18 - 0.24	2.4E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	1.8E-01	NCPSRG	NO	DLBSL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	6.0E-01	NCPSRG	NO	DLBSL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	9.6E-02 J	9.6E-02 J	MG/KG		1/5	0.18 - 0.24	9.6E-02	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.5E+01 C	1.8E+01	NCPSRG	NO	DLBSL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	9.3E-02 J	9.3E-02 J	MG/KG		1/5	0.18 - 0.24	9.3E-02	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	BSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	NO	DLBSL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.7E+01 N	N/A		NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	NO	DLBSL
	78-59-1	Isophorone	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	6.9E-02 C	N/A		NO	DLBSL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	9.9E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL



Table 2.7  
 OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
 Camp Johnson Site 17  
 MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
 Medium: Surface Soil  
 Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Deletion or Selection
	108-95-2	Phenol	ND	ND	MG/KG	IR17-SS05-00-01-09C	0/5	0.18 - 0.24	2.4E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	DLBSL
	72-55-9	4,4'-DDE	6.3E-04 J	2.2E-03 J	MG/KG		4/5	0.0017 - 0.0025	2.2E-03	N/A	1.4E+00 C	N/A		NO	BSL
	50-29-3	4,4'-DDT	9.0E-04 J	1.9E-03 J	MG/KG	IR17-SS02-00-01-09C	3/5	0.0017 - 0.0025	1.9E-03	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	2.9E-02 C*	N/A		NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.017 - 0.024	2.4E-02	N/A	3.9E-01 N	N/A		NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/5	0.017 - 0.024	2.4E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.017 - 0.024	2.4E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/5	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	11097-69-1	Aroclor-1254	ND	ND	MG/KG		0/5	0.017 - 0.024	2.4E-02	N/A	1.1E-01 C**	N/A		NO	DLBSL
	11096-82-5	Aroclor-1260	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	60-57-1	Dieldrin	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	DLBSL
	959-98-8	Endosulfan I	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	72-20-8	Endrin	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	76-44-8	Heptachlor	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/5	0.0017 - 0.0025	2.5E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/5	0.0017 - 0.0025	2.5E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/5	0.035 - 0.049	4.9E-02	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	7429-90-5	Aluminum	5.2E+03	7.6E+03 J+	MG/KG	IR17-SS01-00-01-09C	5/5	73.7 - 107	7.6E+03	5.5E+03	7.7E+03 N	N/A		NO	BSL
	7440-36-0	Antimony	ND	ND	MG/KG		0/5	1.5 - 2.1	2.1E+00	4.5E-01	3.1E+00 N	N/A		NO	DLBSL
	7440-38-2	Arsenic	1.1E+00 J	4.9E+00	MG/KG	IR17-SS01-00-01-09C	5/5	1.5 - 2.1	4.9E+00	6.3E-01	3.9E-01 C*	5.8E+00	NCPSRG	YES	ASL
	7440-39-3	Barium	1.3E+01	2.1E+01	MG/KG		5/5	3.7 - 5.4	2.1E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	1.4E-01 J	1.6E-01	MG/KG	IR17-SS02-00-01-09C	3/5	0.15 - 0.21	1.6E-01	1.0E-01	1.6E+01 N	N/A		NO	BSL
	7440-43-9	Cadmium	2.0E-02 J	2.0E-02 J	MG/KG		1/5	0.44 - 0.64	2.0E-02	3.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL, BBK
	7440-70-2	Calcium	9.2E+01	3.7E+02	MG/KG	IR17-SS01D-00-01-09C	5/5	73.7 - 107	3.7E+02	6.4E+03	N/A	N/A		NO	NUT, BBK



Table 2.7  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Deletion or Selection
	7440-47-3	Chromium	2.7E+00	8.3E+00	MG/KG	IR17-SS01-00-01-09C	5/5	1.5 - 2.1	8.3E+00	6.1E+00	2.9E-01 C	3.8E+00	NCPSRG	YES	ASL
	7440-48-4	Cobalt	2.1E-01 J	3.3E-01 J	MG/KG	IR17-SS04-00-01-09C	4/5	0.37 - 0.54	3.3E-01	2.9E-01	2.3E+00 N	N/A	NCPSRG	NO	BSL
	7440-50-8	Copper	7.0E-01 J	1.0E+00 J	MG/KG	IR17-SS01-00-01-09C	5/5	1.5 - 2.1	1.0E+00	4.8E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL, BBK
	7439-89-6	Iron	1.7E+03	7.6E+03	MG/KG	IR17-SS01-00-01-09C	5/5	11.1 - 16.1	7.6E+03	3.2E+03	5.5E+03 N	1.5E+02	NCPSRG	YES	ASL
	7439-92-1	Lead	7.5E+00	1.7E+01	MG/KG	IR17-SS01-00-01-09C	5/5	1.5 - 2.1	1.7E+01	1.2E+01	4.0E+02 NL	2.7E+02	NCPSRG	NO	BSL
	7439-95-4	Magnesium	1.3E+02	6.7E+02	MG/KG	IR17-SS01-00-01-09C	5/5	18.4 - 26.8	6.7E+02	2.4E+02	N/A	N/A	NCPSRG	NO	NUT
	7439-96-5	Manganese	5.9E+00	1.1E+01	MG/KG	IR17-SS04-00-01-09C	5/5	0.37 - 0.54	1.1E+01	1.4E+01	1.8E+02 N	6.5E+01	NCPSRG	NO	BSL, BBK
	7439-97-6	Mercury	4.2E-02	5.2E-02	MG/KG	IR17-SS01-00-01-09C	2/5	0.032 - 0.045	5.2E-02	8.1E-02	2.3E+00 N	1.0E+00	NCPSRG	NO	BSL, BBK
	7440-02-0	Nickel	1.4E+00	2.0E+00	MG/KG	IR17-SS02-00-01-09C	5/5	0.74 - 1.1	2.0E+00	1.2E+00	1.6E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	1.1E+02	5.0E+02	MG/KG	IR17-SS01-00-01-09C	5/5	73.7 - 107	5.0E+02	1.2E+02	N/A	N/A	NCPSRG	NO	NUT
	7782-49-2	Selenium	6.9E-01 J	6.9E-01 J	MG/KG	IR17-SS01-00-01-09C	1/5	1.5 - 2.1	6.9E-01	5.6E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL
	7440-22-4	Silver	4.0E-01 J	4.0E-01 J	MG/KG	IR17-SS01-00-01-09C	1/5	1.5 - 2.1	4.0E-01	1.4E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	1.3E+01 J	1.9E+03	MG/KG	IR17-SS01D-00-01-09C	4/5	184 - 268	1.9E+03	8.1E+01	N/A	N/A	NCPSRG	NO	NUT
	7440-28-0	Thallium	ND	ND	MG/KG		0/5	2.2 - 3.2	3.2E+00	3.6E-01	N/A	N/A	NCPSRG	NO	NTX
	7440-62-2	Vanadium	5.8E+00	2.1E+01	MG/KG	IR17-SS01-00-01-09C	5/5	3.7 - 5.4	2.1E+01	8.9E+00	3.9E+01 N	N/A	NCPSRG	NO	BSL
	7440-66-6	Zinc	4.3E+00	5.2E+00	MG/KG	SS05-00-01-09C	4/5	3.7 - 5.4	5.2E+00	1.1E+01	2.4E+03 N	1.2E+03	NCPSRG	NO	BSL, BBK



Table 2.7  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
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[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background surface soil concentrations.

Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

J = Estimated Value

J+ = Analyte present, value may be biased high, actual value may be lower

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),

Csat used as screening level.



**TABLE 2.7a**

Risk Ratio Screening for Surface Soil, Maximum Detected Concentration  
 Camp Johnson Site 17  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Arsenic	5 / 5	4.9E+00	IR17-SS01-00-01-09C	3.9E-01	1E-06	NA	1E-05	NA
Chromium	5 / 5	8.3E+00	IR17-SS01-00-01-09C	2.9E-01	1E-06	NA	3E-05	NA
Iron	5 / 5	7.6E+03	IR17-SS01-00-01-09C	5.5E+04	1	0.1	NA	Gastrointestinal
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>0.1</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>4E-05</b>	
Total Gastrointestinal HI =								0.1

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Constituent of Potential Concern

HI = Hazard Index

mg/kg = milligrams per kilogram

NA = Not available/not applicable



Table 2.8  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Site 17	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR17-SB01-2-4-09C	0/9	0.0014 - 0.0065	6.5E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.1E+00 C	N/A		NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	1.1E-03 J	1.1E-03 J	MG/KG	IR17-SB01-2-4-09C	1/9	0.0014 - 0.0065	6.5E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	BSL
	96-12-8	1,2-Dibromo-3-chloropropane	1.6E-03 J	1.6E-03 J	MG/KG		1/9	0.0014 - 0.0065	6.5E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	YES	ASL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	9.0E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	MG/KG	IR17-SS04-00-01-09C	0/9	0.0014 - 0.0065	6.5E-03	N/A	2.4E+00 C	N/A		NO	DLBSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	DLBSL
	78-93-3	2-Butanone	1.4E-03 J	2.3E-02 J	MG/KG		6/10	0.0029 - 0.013	2.3E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	ND	ND	MG/KG		0/9	0.0029 - 0.013	1.3E-02	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	DLBSL
	108-10-1	4-Methyl-2-pentanone	ND	ND	MG/KG		0/9	0.0029 - 0.013	1.3E-02	N/A	5.3E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	7.0E-02 J	9.0E-01 J	MG/KG	IR17-SS04-00-01-09C	6/10	0.0029 - 0.013	9.0E-01	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	DLBSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/8	0.0029 - 0.011	1.1E-02	N/A	7.3E-01 N	N/A		NO	DLBSL
	75-15-0	Carbon disulfide	ND	ND	MG/KG	IR17-SS02-00-01-09C	0/9	0.0014 - 0.0065	6.5E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	DLBSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/9	0.0029 - 0.013	1.3E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	2.3E-03	1.3E-02 J	MG/KG		3/9	0.0014 - 0.0065	1.3E-02	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	BSL
	74-87-3	Chloromethane	6.5E-03 J	6.5E-03 J	MG/KG	IR17-SS01-00-01-09C	1/9	0.0029 - 0.013	6.5E-03	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	BSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	110-82-7	Cyclohexane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.2E+02 NS	N/A		NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG	IR17-SB03-2-7-09C	0/9	0.0014 - 0.0065	6.5E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL
	98-82-8	Isopropylbenzene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	DLBSL
	79-20-9	Methyl acetate	1.3E-03 J	9.6E-02 J	MG/KG		8/10	0.0014 - 0.0065	9.6E-02	N/A	7.8E+03 N	N/A		NO	BSL



Table 2.8  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	108-87-2	Methylcyclohexane	ND	ND	MG/KG	IR17-SB03-2-7-09C	0/9	0.0014 - 0.0065	6.5E-03	N/A	5.7E+01 N	N/A		NO	DLBSL
	75-09-2	Methylene chloride	1.5E-03 J	1.5E-03 J	MG/KG		1/9	0.0029 - 0.013	1.5E-03	N/A	1.1E+01 C	2.3E-02	NCPSRG	NO	BSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	4.3E+01 C	8.5E-02	NCPSRG	NO	DLBSL
	100-42-5	Styrene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	6.3E+02 N	9.2E-01	NCPSRG	NO	DLBSL
	127-18-4	Tetrachloroethene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	5.5E-01 C	5.0E-03	NCPSRG	NO	DLBSL
	108-88-3	Toluene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	5.0E+02 N	5.5E+00	NCPSRG	NO	DLBSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.5E+01 N	5.1E-01	NCPSRG	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	2.8E+00 C	1.8E-02	NCPSRG	NO	DLBSL
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	7.9E+01 N	2.4E+01	NCPSRG	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/8	0.0029 - 0.013	1.3E-02	N/A	6.0E-02 C	1.9E-04	NCPSRG	NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/9	0.0014 - 0.0065	6.5E-03	N/A	6.3E+01 N	6.0E+00	NCPSRG	NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.1E+02 NS	4.3E+01	NCPSRG	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.9E+01 N	4.1E-03	NCPSRG	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	1.6E+00	NCPSRG	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	4.9E-01 N	N/A		NO	DLBSL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.4E+02 N	8.4E+00	NCPSRG	NO	DLBSL



Table 2.8  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	208-96-8	Acenaphthylene	ND	ND	MG/KG	IR17-SS01-00-01-09C	0/10	0.18 - 0.24	2.4E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/5	0.18 - 0.24	2.4E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	1.8E-01	NCPSRG	NO	DLBSL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	6.0E-01	NCPSRG	NO	DLBSL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	9.6E-02 J	9.6E-02 J	MG/KG		1/10	0.18 - 0.24	9.6E-02	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.5E+01 C	1.8E+01	NCPSRG	NO	DLBSL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	9.3E-02 J	9.3E-02 J	MG/KG		1/10	0.18 - 0.24	9.3E-02	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	BSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	NO	DLBSL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.7E+01 N	N/A		NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	MG/KG	IR17-SS01-00-01-09C	0/10	0.035 - 0.049	4.9E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	NO	DLBSL
	78-59-1	Isophorone	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/10	0.035 - 0.049	4.9E-02	N/A	6.9E-02 C	N/A		NO	DLBSL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	9.9E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL



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OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	108-95-2	Phenol	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/10	0.18 - 0.24	2.4E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	DLBSL
	72-55-9	4,4'-DDE	4.1E-04 J	2.2E-03 J	MG/KG	IR17-SS05-00-01-09C	5/10	0.0017 - 0.0025	2.2E-03	N/A	1.4E+00 C	N/A		NO	BSL
	50-29-3	4,4'-DDT	9.0E-04 J	1.9E-03 J	MG/KG	IR17-SS02-00-01-09C	3/10	0.0017 - 0.0025	1.9E-03	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	2.9E-02 C*	N/A		NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	3.9E-01 N	N/A		NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	11097-69-1	Aroclor-1254	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	1.1E-01 C**	N/A		NO	DLBSL
	11096-82-5	Aroclor-1260	ND	ND	MG/KG		0/10	0.017 - 0.024	2.4E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	60-57-1	Dieldrin	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	DLBSL
	959-98-8	Endosulfan I	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	72-20-8	Endrin	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	76-44-8	Heptachlor	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	ND	ND	MG/KG		0/10	0.0017 - 0.0025	2.5E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/10	0.033 - 0.049	4.9E-02	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	<b>7429-90-5</b>	<b>Aluminum</b>	<b>4.5E+03</b>	<b>2.0E+04</b>	<b>MG/KG</b>	<b>IR17-SB03-2-7-09C</b>	<b>10/10</b>	<b>73.7 - 107</b>	<b>2.0E+04</b>	<b>5.5E+03</b>	<b>7.7E+03 N</b>	<b>N/A</b>		<b>YES</b>	<b>ASL</b>
	7440-36-0	Antimony	9.3E-01 J	9.3E-01 J	MG/KG	IR17-SB01-2-4-09C	1/10	1.5 - 2.1	9.3E-01	3.6E-01	3.1E+00 N	N/A		NO	BSL
	<b>7440-38-2</b>	<b>Arsenic</b>	<b>9.5E-01 J</b>	<b>1.5E+01</b>	<b>MG/KG</b>	<b>IR17-SB03D-2-7-09C</b>	<b>10/10</b>	<b>1.5 - 2.1</b>	<b>1.5E+01</b>	<b>6.3E-01</b>	<b>3.9E-01 C*</b>	<b>5.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-39-3	Barium	6.6E+00	2.2E+01	MG/KG	IR17-SB03-2-7-09C	10/10	3.7 - 5.4	2.2E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	5.5E-02 J	3.1E-01	MG/KG	IR17-SB03-2-7-09C	8/10	0.15 - 0.21	3.1E-01	1.0E-01	1.6E+01 N	N/A		NO	BSL
	7440-43-9	Cadmium	2.0E-02 J	2.0E-02 J	MG/KG	IR17-SS02-00-01-09C	1/10	0.44 - 0.64	2.0E-02	2.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL, BBK
	7440-70-2	Calcium	9.2E+01	3.7E+02	MG/KG	IR17-SS01D-00-01-09C	7/10	73.7 - 107	3.7E+02	4.4E+02	N/A	N/A		NO	NUT, BBK



Table 2.8  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	<b>7440-47-3</b>	<b>Chromium</b>	<b>2.7E+00</b>	<b>3.6E+01</b>	<b>MG/KG</b>	<b>IR17-SB03-2-7-09C</b>	<b>10/10</b>	<b>1.5 - 2.1</b>	<b>3.6E+01</b>	<b>6.1E+00</b>	<b>2.9E-01 C</b>	<b>3.8E+00</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-48-4	Cobalt	2.1E-01 J	1.1E+00	MG/KG	IR17-SB03-2-7-09C	9/10	0.37 - 0.54	1.1E+00	2.9E-01	2.3E+00 N	N/A	NCPSRG	NO	BSL
	7440-50-8	Copper	6.6E-01 J	5.0E+00	MG/KG	IR17-SB03-2-7-09C	10/10	1.5 - 2.1	5.0E+00	2.6E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	<b>7439-89-6</b>	<b>Iron</b>	<b>1.7E+03</b>	<b>2.8E+04</b>	<b>MG/KG</b>	<b>IR17-SB03D-2-7-09C</b>	<b>10/10</b>	<b>11.1 - 16.1</b>	<b>2.8E+04</b>	<b>3.2E+03</b>	<b>5.5E+03 N</b>	<b>1.5E+02</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7439-92-1	Lead	3.3E+00	1.7E+01	MG/KG	IR17-SS01-00-01-09C	10/10	1.5 - 2.1	1.7E+01	8.5E+00	4.0E+02 NL	2.7E+02	NCPSRG	NO	BSL
	7439-95-4	Magnesium	1.3E+02	1.0E+03	MG/KG	IR17-SB03-2-7-09C	10/10	18.4 - 26.8	1.0E+03	2.4E+02	N/A	N/A	NCPSRG	NO	NUT
	7439-96-5	Manganese	5.4E+00	1.3E+01	MG/KG	IR17-SB03D-2-7-09C	10/10	0.37 - 0.54	1.3E+01	9.3E+00	1.8E+02 N	6.5E+01	NCPSRG	NO	BSL
	7439-97-6	Mercury	4.2E-02	5.2E-02	MG/KG	IR17-SS01-00-01-09C	3/10	0.032 - 0.045	5.2E-02	7.1E-02	2.3E+00 N	1.0E+00	NCPSRG	NO	BSL, BBK
	7440-02-0	Nickel	1.2E+00	2.7E+00	MG/KG	IR17-SB03-2-7-09C	10/10	0.74 - 1.1	2.7E+00	1.2E+00	1.5E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	1.1E+02	1.1E+03	MG/KG	IR17-SB03-2-7-09C	10/10	73.7 - 107	1.1E+03	1.2E+02	N/A	N/A	NCPSRG	NO	NUT
	7782-49-2	Selenium	6.9E-01 J	1.4E+00 J	MG/KG	IR17-SB03D-2-7-09C	2/10	1.5 - 2.1	1.4E+00	5.1E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL
	7440-22-4	Silver	4.0E-01 J	4.0E-01 J	MG/KG	IR17-SS01-00-01-09C	1/10	1.5 - 2.1	4.0E-01	1.3E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	5.3E+00 J	1.9E+03	MG/KG	IR17-SS01D-00-01-09C	9/10	184 - 268	1.9E+03	6.8E+01	N/A	N/A	NCPSRG	NO	NUT
	7440-28-0	Thallium	ND	ND	MG/KG		0/10	2.2 - 3.2	3.2E+00	3.6E-01	N/A	N/A	NCPSRG	NO	NTX
	<b>7440-62-2</b>	<b>Vanadium</b>	<b>5.8E+00</b>	<b>7.0E+01</b>	<b>MG/KG</b>	<b>IR17-SB03D-2-7-09C</b>	<b>10/10</b>	<b>3.7 - 5.4</b>	<b>7.0E+01</b>	<b>8.9E+00</b>	<b>3.9E+01 N</b>	<b>N/A</b>	<b>NCPSRG</b>	<b>YES</b>	<b>ASL</b>
	7440-66-6	Zinc	2.4E+00 J	8.9E+00	MG/KG	IR17-SB03-2-7-09C	9/10	3.7 - 5.4	8.9E+00	6.6E+00	2.4E+03 N	1.2E+03	NCPSRG	NO	BSL



Table 2.8  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
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[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations. Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.  
RSL value for n-Hexane used as surrogate for Methylcyclohexane.  
RSL value for 2-Nitroaniline used as surrogate for 3-Nitroaniline.  
RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene  
RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.  
RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.  
RSL value for nitrobenzene used as surrogate for 4-nitrophenol.  
RSL value for acenaphthene used as surrogate for acenaphthylene.  
RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.  
RSL value for anthracene used as surrogate for phenanthrene.  
RSL value for technical chlordane used as surrogate for alpha-chlordane.  
RSL value for technical-HCH used as surrogate for delta-BHC.  
RSL value for technical chlordane used as surrogate for gamma-chlordane.  
RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.  
RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.  
RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.  
RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.  
RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010  
J = Estimated Value

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore  
N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore  
N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),  
Csat used as screening level.



**TABLE 2.8a**

Risk Ratio Screening for Surface and Subsurface Soil, Maximum Detected Concentration  
 Camp Johnson Site 17  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Aluminum	10 / 10	2.0E+04	IR17-SB03-2-7-09C	7.7E+04	1	0.3	NA	Neurological, Developmental
Arsenic	10 / 10	1.5E+01	IR17-SB03D-2-7-09C	3.9E-01	1E-06	NA	4E-05	NA
Chromium	10 / 10	3.6E+01	IR17-SB03-2-7-09C	2.9E-01	1E-06	NA	1E-04	NA
Iron	10 / 10	2.8E+04	IR17-SB03D-2-7-09C	5.5E+04	1	0.5	NA	Gastrointestinal
Vanadium	10 / 10	7.0E+01	IR17-SB03D-2-7-09C	3.9E+02	1	0.2	NA	Hair
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>1.0</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>2E-04</b>	
Total Developmental HI =							0.3	
Total Gastrointestinal HI =							0.5	
Total Hair HI =							0.2	
Total Neurological HI =							0.3	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

mg/kg = milligrams per kilogram

NA = Not available/not applicable



**TABLE 2.8b**

Risk Ratio Screening for Surface and Subsurface Soil, 95% UCL Concentration  
 Camp Johnson Site 17  
 MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL	95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte								
Metals (mg/kg)								
Arsenic	10 / 10	7.0E+00    1, 3	95% App-G	3.9E-01	1E-06	NA	2E-05	NA
Chromium	10 / 10	2.3E+01    1	95% H-UCL	2.9E-01	1E-06	NA	8E-05	NA
Cumulative Corresponding Hazard Index <sup>c</sup>						NA		
Cumulative Corresponding Cancer Risk <sup>d</sup>							1E-04	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable.

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010, ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Approximate Gamma UCL (95% App-G); 95% H UCL (95% H)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.
- (6) Only detected in one sample, detected concentration used.



Table 2.9  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Subsurface Soil  
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
Site 17	16065-83-1 <b>18540-29-9</b>	Chromium (III) <b>Chromium (VI)</b>	2.0E+01 J <b>1.2E+00</b>	3.7E+01 J <b>1.9E+00</b>	MG/KG <b>MG/KG</b>	IR17-SB05-5-6-10C <b>IR17-SB05-5-6-10C</b>	4/5 <b>5/5</b>	0.24 - 0.31 <b>0.67 - 0.74</b>	3.7E+01 <b>1.9E+00</b>	N/A <b>N/A</b>	1.2E+04 N <b>2.9E-01 C</b>	3.6E+05 <b>3.8E+00</b>	NCPSRG <b>NCPSRG</b>	NO <b>YES</b>	BSL <b>ASL</b>

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.  
Chromium III not analyzed for in subsurface soil samples. Concentration of chromium III assumed to be the difference between the reported hexavalent chromium concentration and reported total chromium concentration.

[3] Background values are lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.  
Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.  
<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

J = Estimated Value

C = Carcinogenic

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available/not applicable



**TABLE 2.9a**

Risk Ratio Screening for Surface and Subsurface Soil, Maximum Detected Concentration

Camp Johnson Site 17

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Chromium (VI)	5 / 5	1.9E+00	IR17-SB05-5-6-10C	2.9E-01	1E-06	NA	7E-06	NA
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>0.0</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>7E-06</b>	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

mg/kg = milligrams per kilogram

NA = Not available/not applicable



Table 2.10  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
Site 17	71-55-6	1,1,1-Trichloroethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	9.1E+02 N	2.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	UG/L		0/2	1 - 2.4	2.4E+00	N/A	6.7E-02 C	2.0E-01	15A NCAC 2L	YES	DLASL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	5.9E+03 N	2.0E+05	15A NCAC 2L	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	2.4E-01 C	5.0E+00	MCL	YES	DLASL
	75-34-3	1,1-Dichloroethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	2.4E+00 C	6.0E+00	15A NCAC 2L	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.4E+01 N	7.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.1E-01 C**	7.0E+01	MCL, 15A NCAC 2L	YES	DLASL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	UG/L		0/1	2 - 2	2.0E+00	N/A	3.2E-04 C	2.0E-01	MCL	YES	DLASL
												4.0E-02	15A NCAC 2L		
	106-93-4	1,2-Dibromoethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	6.5E-03 C	5.0E-02	MCL	YES	DLASL
												2.0E-02	15A NCAC 2L		
	95-50-1	1,2-Dichlorobenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.7E+01 N	6.0E+02	MCL	NO	DLBSL
												2.0E+01	15A NCAC 2L		
	107-06-2	1,2-Dichloroethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.5E-01 C	5.0E+00	MCL	YES	DLASL
												4.0E-01	15A NCAC 2L		
	78-87-5	1,2-Dichloropropane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.9E-01 C*	5.0E+00	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	541-73-1	1,3-Dichlorobenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.3E-01 C	2.0E+02	15A NCAC 2L	YES	DLASL
	106-46-7	1,4-Dichlorobenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.3E-01 C	7.5E+01	MCL	YES	DLASL
												6.0E+00	15A NCAC 2L		
	78-93-3	2-Butanone	ND	ND	UG/L		0/2	5 - 5	5.0E+00	N/A	7.1E+02 N	4.0E+03	15A NCAC 2L	NO	DLBSL
	591-78-6	2-Hexanone	ND	ND	UG/L		0/2	5 - 5	5.0E+00	N/A	4.7E+00 N	N/A		YES	DLASL
	108-10-1	4-Methyl-2-pentanone	ND	ND	UG/L		0/2	5 - 5	5.0E+00	N/A	2.0E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	ND	ND	UG/L		0/2	5 - 5	5.0E+00	N/A	2.2E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	71-43-2	Benzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.1E-01 C	5.0E+00	MCL	YES	DLASL
												1.0E+00	15A NCAC 2L		
	75-27-4	Bromodichloromethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.2E-01 C	8.0E+01	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	75-25-2	Bromoform	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	8.5E+00 C*	8.0E+01	MCL	NO	DLBSL
												4.0E+00	15A NCAC 2L		
	74-83-9	Bromomethane	ND	ND	UG/L		0/2	1 - 1.1	1.1E+00	N/A	8.7E-01 N	N/A		YES	DLASL
	75-15-0	Carbon disulfide	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.0E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.4E-01 C	5.0E+00	MCL	YES	DLASL
												3.0E-01	15A NCAC 2L		
	108-90-7	Chlorobenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	9.1E+00 N	1.0E+02	MCL	NO	DLBSL
												5.0E+01	15A NCAC 2L		



Table 2.10  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	75-00-3 67-66-3	Chloroethane <b>Chloroform</b>	ND <b>4.4E+00</b>	ND <b>4.4E+00</b>	UG/L <b>UG/L</b>	<b>IR17-TW01-09C</b>	0/2 <b>1/2</b>	1 - 1 <b>1 - 1</b>	1.0E+00 <b>4.4E+00</b>	N/A <b>N/A</b>	2.1E+03 N <b>1.9E-01 C</b>	3.0E+03 <b>8.0E+01</b>	15A NCAC 2L <b>MCL</b>	NO <b>YES</b>	DLBSL <b>ASL</b>
	74-87-3	Chloromethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.9E+01 N	3.0E+00	15A NCAC 2L	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.7E+01 N	7.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	110-82-7	Cyclohexane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.3E+03 N	N/A		NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.5E-01 C	6.0E+01	MCL	YES	DLASL
											4.0E-01	15A NCAC 2L			
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.9E+01 N	1.0E+03	15A NCAC 2L	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.5E+00 C	7.0E+02	MCL	NO	DLBSL
											6.0E+02	15A NCAC 2L			
	98-82-8	Isopropylbenzene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	6.8E+01 N	7.0E+01	15A NCAC 2L	NO	DLBSL
	79-20-9	Methyl acetate	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	3.7E+03 N	N/A		NO	DLBSL
	108-87-2	Methylcyclohexane	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	8.8E+01 N	N/A		NO	DLBSL
	75-09-2	Methylene chloride	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.8E+00 C	5.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.3E+01 C	2.0E+01	15A NCAC 2L	NO	DLBSL
	100-42-5	Styrene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.6E+02 N	1.0E+02	MCL	NO	DLBSL
											7.0E+01	15A NCAC 2L			
	127-18-4	Tetrachloroethene	ND	ND	UG/L		0/2	1 - 1.1	1.1E+00	N/A	1.1E-01 C	5.0E+00	MCL	YES	DLASL
											7.0E-01	15A NCAC 2L			
	108-88-3	Toluene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	2.3E+02 N	1.0E+03	MCL	NO	DLBSL
											6.0E+02	15A NCAC 2L			
	156-60-5	trans-1,2-Dichloroethene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.1E+01 N	1.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	79-01-6	Trichloroethene	ND	ND	UG/L		0/2	1 - 5.1	5.1E+00	N/A	2.0E+00 C	5.0E+00	MCL	YES	DLASL
											3.0E+00	15A NCAC 2L			
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.3E+02 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	1.6E-02 C	2.0E+00	MCL	YES	DLASL
											3.0E-02	15A NCAC 2L			
	1330-20-7	Xylene, total	ND	ND	UG/L		0/2	1 - 1.2	1.2E+00	N/A	2.0E+01 N	1.0E+04	MCL	NO	DLBSL
											5.0E+02	15A NCAC 2L			
	92-52-4	1,1-Biphenyl	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.8E+02 N	4.0E+02	15A NCAC 2L	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.2E-01 C	N/A		YES	DLASL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	7.3E+01 N	1.0E+02	15A NCAC 2L	NO	DLBSL



Table 2.10  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	51-28-5	2,4-Dinitrophenol	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	7.3E+00 N	N/A		YES	DLASL
	121-14-2	2,4-Dinitrotoluene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.2E-01 C	N/A		YES	DLASL
	606-20-2	2,6-Dinitrotoluene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	91-58-7	2-Chloronaphthalene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E+02 N	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.8E+01 N	4.0E-01	15A NCAC 2L	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.5E+01 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.8E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	1.5E-01 C	N/A		YES	DLASL
	99-09-2	3-Nitroaniline	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	2.9E-01 N	N/A		YES	DLASL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.4E-01 C	N/A		YES	DLASL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	1.8E+01 N	4.0E+01	15A NCAC 2L	YES	DLASL
	100-01-6	4-Nitroaniline	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.4E+00 C*	N/A		YES	DLASL
	100-02-7	4-Nitrophenol	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	83-32-9	Acenaphthene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.2E+02 N	8.0E+01	15A NCAC 2L	NO	DLBSL
	208-96-8	Acenaphthylene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.2E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+03 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	2.9E-01 C	3.0E+00	MCL, 15A NCAC 2L	YES	DLASL
	56-55-3	Benzo(a)anthracene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	50-32-8	Benzo(a)pyrene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-03 C	2.0E-01	MCL	YES	DLASL
												5.0E-03	15A NCAC 2L		
	205-99-2	Benzo(b)fluoranthene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-01 C	5.0E-01	15A NCAC 2L	YES	DLASL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.2E-02 C	3.0E-02	15A NCAC 2L	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	4.8E+00 C	6.0E+00	MCL	YES	DLASL
												3.0E+00	15A NCAC 2L		
	85-68-7	Butylbenzylphthalate	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.5E+01 C	1.0E+03	15A NCAC 2L	NO	DLBSL
	105-60-2	Caprolactam	4.5E+00 J	4.5E+00 J	UG/L	IR17-TW01-09C	1/2	10 - 10	4.5E+00	N/A	1.8E+03 N	4.0E+03	15A NCAC 2L	NO	BSL
	86-74-8	Carbazole	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	N/A	N/A		NO	NTX



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Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	218-01-9	Chrysene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E+00 C	5.0E+00	15A NCAC 2L	YES	DLASL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-03 C	5.0E-03	15A NCAC 2L	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	84-66-2	Diethylphthalate	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	3.7E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	117-84-0	Di-n-octylphthalate	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	4.8E+00 C	1.0E+02	15A NCAC 2L	YES	DLASL
	206-44-0	Fluoranthene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	86-73-7	Fluorene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	4.2E-02 C	1.0E+00	MCL	YES	DLASL
											2.0E-02		15A NCAC 2L		
	87-68-3	Hexachlorobutadiene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	8.6E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.2E+01 N	5.0E+01	MCL	NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	3.7E+00 C**	N/A		YES	DLASL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	78-59-1	Isophorone	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	7.1E+01 C	4.0E+01	15A NCAC 2L	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.4E-01 C*	6.0E+00	15A NCAC 2L	YES	DLASL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	9.6E-03 C	N/A		YES	DLASL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.4E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	87-86-5	Pentachlorophenol	ND	ND	UG/L		0/2	20 - 20	2.0E+01	N/A	5.6E-01 C	1.0E+00	MCL	YES	DLASL
											3.0E-01		15A NCAC 2L		
	85-01-8	Phenanthrene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+03 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	108-95-2	Phenol	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+03 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	129-00-0	Pyrene	ND	ND	UG/L		0/2	10 - 10	1.0E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	72-54-8	4,4'-DDD	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.8E-01 C	1.0E-01	15A NCAC 2L	NO	DLBSL
	72-55-9	4,4'-DDE	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.0E-01 C	N/A		NO	DLBSL
	50-29-3	4,4'-DDT	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.0E-01 C*	1.0E-01	15A NCAC 2L	NO	DLBSL
	309-00-2	Aldrin	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	4.0E-03 C	N/A		YES	DLASL
	319-84-6	alpha-BHC	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.1E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	5103-71-9	alpha-Chlordane	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.9E-01 C*	2.0E+00	MCL	NO	DLBSL
											1.0E-01		15A NCAC 2L		
	12674-11-2	Aroclor-1016	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	2.6E-01 C**	5.0E-01	MCL	YES	DLASL
	11104-28-2	Aroclor-1221	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	11141-16-5	Aroclor-1232	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	53469-21-9	Aroclor-1242	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	12672-29-6	Aroclor-1248	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	11097-69-1	Aroclor-1254	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	3.4E-02 C*	5.0E-01	MCL	YES	DLASL



Table 2.10  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	11096-82-5	Aroclor-1260	ND	ND	UG/L		0/2	0.5 - 0.5	5.0E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	319-85-7	beta-BHC	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	319-86-8	delta-BHC	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	60-57-1	Dieldrin	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	4.2E-03 C	2.0E-03	15A NCAC 2L	YES	DLASL
	959-98-8	Endosulfan I	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	72-20-8	Endrin	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.1E+00 N	2.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	6.1E-02 C	2.0E-01	MCL	NO	DLBSL
	5103-74-2	gamma-Chlordane	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.9E-01 C*	3.0E-02	15A NCAC 2L	NO	DLBSL
	76-44-8	Heptachlor	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.5E-02 C	4.0E-01	MCL	YES	DLASL
	1024-57-3	Heptachlor epoxide	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	7.4E-03 C*	8.0E-03	15A NCAC 2L	YES	DLASL
	72-43-5	Methoxychlor	ND	ND	UG/L		0/2	0.05 - 0.05	5.0E-02	N/A	1.8E+01 N	4.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	UG/L		0/2	1 - 1	1.0E+00	N/A	6.1E-02 C	3.0E+00	MCL	YES	DLASL
	7429-90-5	Aluminum	1.3E+03	1.7E+03	UG/L	IR17-TW01-09C	2/2	1000 - 1000	1.7E+03	1.9E+03	3.7E+03 N	50 - 200	SMCL	NO	BSL, BBK
	7440-36-0	Antimony	ND	ND	UG/L		0/2	20 - 20	2.0E+01	3.3E+00	1.5E+00 N	6.0E+00	MCL	YES	DLASL
	7440-38-2	Arsenic	ND	ND	UG/L		0/2	20 - 20	2.0E+01	5.8E+00	4.5E-02 C	1.0E+01	MCL, 15A NCAC 2L	YES	DLASL
	7440-39-3	Barium	9.2E+00 J	4.7E+02	UG/L	IR17-TW01-09C	2/2	50 - 50	4.7E+02	8.6E+01	7.3E+02 N	2.0E+03	MCL	NO	BSL
	7440-41-7	Beryllium	1.6E-01 J	1.6E-01 J	UG/L	IR17-TW02D-09C	1/2	2 - 2	1.6E-01	3.1E-01	7.3E+00 N	4.0E+00	MCL	NO	BSL, BBK
	7440-43-9	Cadmium	ND	ND	UG/L		0/2	6 - 6	6.0E+00	3.6E-01	1.8E+00 N	5.0E+00	MCL	YES	DLASL
	7440-70-2	Calcium	9.1E+02 J	1.1E+05	UG/L	IR17-TW01-09C	2/2	1000 - 1000	1.1E+05	6.9E+04	N/A	2.0E+00	15A NCAC 2L	NO	NUT
	7440-47-3	Chromium	1.8E+00 J	1.8E+00 J	UG/L	IR17-TW01-09C	1/2	20 - 20	1.8E+00	3.1E+00	4.3E-02 C	1.0E+02	MCL	NO	BBK
	7440-48-4	Cobalt	ND	ND	UG/L		0/2	5 - 5	5.0E+00	3.4E+00	1.1E+00 N	N/A	15A NCAC 2L	YES	DLASL
	7440-50-8	Copper	ND	ND	UG/L		0/2	20 - 20	2.0E+01	2.8E+00	1.5E+02 N	1.3E+03	MCL	NO	DLBSL
	7439-89-6	Iron	1.2E+03	2.6E+03	UG/L	IR17-TW01-09C	2/2	150 - 150	2.6E+03	6.0E+03	2.6E+03 N	1.0E+03	15A NCAC 2L	NO	BSL, BBK
	7439-92-1	Lead	3.2E+00 J	3.2E+00 J	UG/L	IR17-TW02D-09C	2/2	20 - 20	3.2E+00	2.8E+00	N/A	3.0E+02	SMCL, 15A NCAC 2L	NO	BSL
	7439-95-4	Magnesium	5.4E+02	5.7E+04	UG/L	IR17-TW01-09C	2/2	250 - 250	5.7E+04	6.4E+03	N/A	1.5E+01	MCL, 15A NCAC 2L	NO	NUT



Table 2.10  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 17  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection
	7439-96-5 7439-97-6	Manganese Mercury	1.8E+01 2.5E-01	5.8E+01 2.5E-01	UG/L UG/L	IR17-TW01-09C IR17-TW01-09C	2/2 1/2	5 - 5 0.2 - 0.2	5.8E+01 2.5E-01	2.1E+02 1.0E-01	8.8E+01 N 1.1E+00 N	5.0E+01 2.0E+00 1.0E+00	SMCL, 15A NCAC 2L MCL 15A NCAC 2L	NO NO NO	BSL, BBK BSL
	7440-02-0 7440-09-7 7782-49-2	Nickel Potassium Selenium	1.4E+01 1.1E+03 4.2E+00 J	1.4E+01 8.3E+03 4.2E+00 J	UG/L UG/L UG/L	IR17-TW01-09C IR17-TW01-09C IR17-TW02D-09C	1/2 2/2 1/2	10 - 10 1000 - 1000 20 - 20	1.4E+01 8.3E+03 4.2E+00	8.0E+00 3.3E+03 3.1E+00	7.3E+01 N N/A 1.8E+01 N	1.0E+02 N/A 5.0E+01	15A NCAC 2L N/A MCL	NO NO NO	BSL NUT BSL
	7440-22-4	Silver	ND	ND	UG/L		0/2	20 - 20	2.0E+01	7.7E-01	1.8E+01 N	2.0E+01 2.0E+01 1.0E+02	15A NCAC 2L 15A NCAC 2L SMCL	YES	DLASL
	7440-23-5 7440-28-0 7440-62-2 7440-66-6	Sodium Thallium Vanadium Zinc	7.5E+03 ND ND 5.7E+00 J	5.0E+05 ND ND 1.0E+01 J	UG/L UG/L UG/L UG/L	IR17-TW01-09C IR17-TW01-09C IR17-TW01-09C IR17-TW01-09C	2/2 0/2 0/2 2/2	2500 - 2500 30 - 30 50 - 50 50 - 50	5.0E+05 3.0E+01 5.0E+01 1.0E+01	2.3E+04 3.8E+00 4.7E+00 4.2E+01	N/A N/A 1.8E+01 N 1.1E+03 N	N/A 2.0E+00 N/A 1.0E+03 5.0E+03	MCL MCL 15A NCAC 2L SMCL	NO NO YES NO	NUT NTX DLASL BSL, BBK

- [1] Minimum/Maximum detected concentrations.
- [2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.
- [3] Background values are two times the arithmetic mean basewide background shallow groundwater concentrations. Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.
- [4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels for Chemical Contaminants at Superfund Sites. <http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) tap water RSLs.
- RSL value for n-Hexane used as surrogate for Methylcyclohexane.
- RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene
- RSL value for 2-Nitroaniline used as surrogate for 3-Nitroaniline.
- RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.
- RSL value for nitrobenzene used as surrogate for 4-nitrophenol.
- RSL value for acenaphthene used as surrogate for acenaphthylene.
- RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.
- RSL value for anthracene used as surrogate for phenanthrene.
- RSL value for technical chlordane used as surrogate for alpha-chlordane.
- RSL value for technical-HCH used as surrogate for delta-BHC.
- RSL value for technical chlordane used as surrogate for gamma-chlordane.
- RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.
- RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.
- RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.
- RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.
- RSL value for chromium VI used for total chromium.
- [5] Rationale Codes
- Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA
- Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern  
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered  
MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards  
SMCL = Secondary Maximum Contaminant Level  
15A NCAC 2L = North Carolina Classifications and Groundwater Quality Standards,  
January 2010.  
J = Estimated Value  
C\* = N screening level < 100x C screening level, therefore  
N screening value/10 used as screening level  
C\*\* = N screening level < 10x C screening level, therefore  
N screening value/10 used as screening level  
N = Noncarcinogenic  
N/A = Not available/not applicable  
ND = Not detected  
UG/L = Micrograms per liter



**TABLE 2109a**

Risk Ratio Screening for Groundwater, Maximum Detected Concentration

Camp Johnson Site 17

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Volatile Organic Compounds (ug/L)</b>								
Chloroform	1 / 2	4.4E+00	IR17-TW01-09C	1.9E-01	1E-06	NA	2E-05	NA
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>NA</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>2E-05</b>	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

ug/L = micrograms per liter

NA = Not available/not applicable



Table 2.11  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Site 85	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR85-SS14D-00-01-09C	0/10	0.0043 - 0.0095	9.5E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.1E+00 C	N/A	NCPSRG	NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	DLBSL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	YES	DLASL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	8.9E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.4E+00 C	N/A	NCPSRG	NO	DLBSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	DLBSL
	78-93-3	2-Butanone	6.6E-03 J	2.7E-02 J	MG/KG		5/10	0.0086 - 0.019	2.7E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	DLBSL
	108-10-1	4-Methyl-2-pentanone	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	5.3E+02 N	N/A	NCPSRG	NO	DLBSL
	67-64-1	Acetone	3.8E-02 J	1.3E+00 J	MG/KG		12/12	0.0086 - 0.019	1.3E+00	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	ND	ND	MG/KG	IR85-SS09-00-01-09C	0/10	0.0043 - 0.0095	9.5E-03	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	DLBSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	7.3E-01 N	N/A	NCPSRG	NO	DLBSL
	75-15-0	Carbon disulfide	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	DLBSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	DLBSL
	74-87-3	Chloromethane	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	110-82-7	Cyclohexane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.2E+02 NS	N/A	NCPSRG	NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL
	98-82-8	Isopropylbenzene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	DLBSL
	79-20-9	Methyl acetate	3.8E-03 J	2.0E-01 J	MG/KG		10/10	0.0043 - 0.0095	2.0E-01	N/A	7.8E+03 N	N/A	NCPSRG	NO	BSL



Table 2.11  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	108-87-2	Methylcyclohexane	ND	ND	MG/KG	IR85-SS17-00-01-09C	0/10	0.0043 - 0.0095	9.5E-03	N/A	5.7E+01 N	N/A	NCPSRG	NO	DLBSL
	75-09-2	Methylene chloride	1.4E-02 J	1.4E-02 J	MG/KG		1/10	0.0086 - 0.019	1.4E-02	N/A	1.1E+01 C	2.3E-02		NO	BSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	4.3E+01 C	8.5E-02		NO	DLBSL
	100-42-5	Styrene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.3E+02 N	9.2E-01		NO	DLBSL
	127-18-4	Tetrachloroethene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	5.5E-01 C	5.0E-03		NO	DLBSL
	108-88-3	Toluene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	5.0E+02 N	5.5E+00		NO	DLBSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.5E+01 N	5.1E-01		NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	1.7E+00 C*	2.3E-03		NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	2.8E+00 C	1.8E-02		NO	DLBSL
	75-69-4	Trichlorofluoromethane (Freon-11)	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	7.9E+01 N	2.4E+01		NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/10	0.0086 - 0.019	1.9E-02	N/A	6.0E-02 C	1.9E-04		NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/10	0.0043 - 0.0095	9.5E-03	N/A	6.3E+01 N	6.0E+00		NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.1E+02 NS	4.3E+01		NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.9E+01 N	4.1E-03		NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	1.6E+00		NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	4.9E-01 N	N/A		NO	DLBSL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.4E+02 N	8.4E+00		NO	DLBSL



Table 2.11  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	208-96-8	Acenaphthylene	ND	ND	MG/KG	IR85-SS06-00-01-09C	0/13	0.18 - 0.23	2.3E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	7.8E+02 N	N/A	NCPSRG	NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	7.8E+02 N	N/A	NCPSRG	NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	1.8E-01	NCPSRG	NO	DLBSL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	6.0E-01	NCPSRG	NO	DLBSL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.8E+01 N	N/A	NCPSRG	NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	2.9E-02 J	1.4E-01 J	MG/KG		3/13	0.18 - 0.23	1.4E-01	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	N/A	N/A	NCPSRG	NO	NTX
	218-01-9	Chrysene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.5E+01 C	1.8E+01	NCPSRG	NO	DLBSL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	N/A	N/A	NCPSRG	NO	NTX
	84-74-2	Di-n-butylphthalate	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	DLBSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	NO	DLBSL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/12	0.18 - 0.23	2.3E-01	N/A	3.7E+01 N	N/A	NCPSRG	NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	6.1E+00 C**	N/A	NCPSRG	NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	NO	DLBSL
	78-59-1	Isophorone	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	6.9E-02 C	N/A	NCPSRG	NO	DLBSL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	9.9E+01 C	N/A	NCPSRG	NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	4.8E+00 C*	N/A	NCPSRG	NO	DLBSL
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL



Table 2.11  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	108-95-2	Phenol	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	3.9E-04 J	3.1E-03 J	MG/KG	IR85-SS18-00-01-09C	5/13	0.0018 - 0.0023	3.1E-03	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	BSL
	72-55-9	4,4'-DDE	6.4E-04 J	2.9E-02 J	MG/KG	IR85-SS18-00-01-09C	12/13	0.0018 - 0.0023	2.9E-02	N/A	1.4E+00 C	N/A		NO	BSL
	50-29-3	4,4'-DDT	6.8E-04 J	2.5E-02 J	MG/KG	IR85-SS18-00-01-09C	11/13	0.0018 - 0.0023	2.5E-02	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	2.9E-02 C*	N/A		NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	3.9E-01 N	N/A		NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	11097-69-1	Aroclor-1254	4.0E-02 J	5.0E-02	MG/KG	IR85-SS17-00-01-09C	2/13	0.017 - 0.023	5.0E-02	N/A	1.1E-01 C**	N/A		NO	BSL
	11096-82-5	Aroclor-1260	ND	ND	MG/KG		0/13	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	60-57-1	Dieldrin	1.9E-03 J	1.9E-03 J	MG/KG	IR85-SS17-00-01-09C	1/13	0.0018 - 0.0023	1.9E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	BSL
	959-98-8	Endosulfan I	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	72-20-8	Endrin	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	8.8E-04 J	2.7E-03 J	MG/KG	IR85-SS18-00-01-09C	2/13	0.0018 - 0.0023	2.7E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	76-44-8	Heptachlor	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	ND	ND	MG/KG		0/13	0.0018 - 0.0023	2.3E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/13	0.036 - 0.047	4.7E-02	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	7429-90-5	Aluminum	3.0E+03 J+	7.3E+03 J+	MG/KG	IR85-SS14D-00-01-09C	13/13	75.2 - 1930	7.3E+03	5.5E+03	7.7E+03 N	N/A		NO	BSL
	7440-36-0	Antimony	5.9E+00 J-	5.9E+00 J-	MG/KG	IR85-SS18-00-01-09C	1/13	1.5 - 38.5	5.9E+00	4.5E-01	3.1E+00 N	N/A		YES	ASL
	7440-38-2	Arsenic	5.7E-01 J	9.9E+00 J	MG/KG	IR85-SS17-00-01-09C	13/13	1.5 - 38.5	9.9E+00	6.3E-01	3.9E-01 C*	5.8E+00	NCPSRG	YES	ASL
	7440-39-3	Barium	5.9E+00	3.1E+01 J	MG/KG	IR85-SS17-00-01-09C	12/13	3.8 - 96.3	3.1E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	2.5E-02 J	9.6E-02 J	MG/KG	IR85-SS18-00-01-09C	9/13	0.15 - 3.9	9.6E-02	1.0E-01	1.6E+01 N	N/A		NO	BSL, BBK
	7440-43-9	Cadmium	5.9E-01	3.5E+00	MG/KG	IR85-SS18-00-01-09C	3/13	0.45 - 11.6	3.5E+00	3.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL
	7440-70-2	Calcium	4.1E+01 J	4.7E+02	MG/KG	IR85-SS16-00-01-09C	8/13	75.2 - 1930	4.7E+02	6.4E+03	N/A	N/A		NO	NUT, BBK



Table 2.11  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Current/Future  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-47-3	Chromium	2.7E+00	8.5E+00 J	MG/KG	IR85-SS18-00-01-09C	12/13	1.5 - 38.5	8.5E+00	6.1E+00	2.9E-01 C	3.8E+00	NCPSRG	YES	ASL
	7440-48-4	Cobalt	1.1E-01 J	2.4E+00 J	MG/KG	IR85-SS17-00-01-09C	11/13	0.38 - 9.6	2.4E+00	2.9E-01	2.3E+00 N	N/A		YES	ASL
	7440-50-8	Copper	7.6E-01 J	2.1E+02	MG/KG	IR85-SS18-00-01-09C	13/13	1.5 - 38.5	2.1E+02	4.8E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	7439-89-6	Iron	1.7E+03	1.2E+04	MG/KG	IR85-SS18-00-01-09C	13/13	11.3 - 289	1.2E+04	3.2E+03	5.5E+03 N	1.5E+02	NCPSRG	YES	ASL
	7439-92-1	Lead	4.8E+00	6.1E+02	MG/KG	IR85-SS18-00-01-09C	13/13	1.5 - 38.5	6.1E+02	1.2E+01	4.0E+02 NL	2.7E+02	NCPSRG	YES	ASL
	7439-95-4	Magnesium	8.1E+01 J	1.8E+02	MG/KG	IR85-SS14D-00-01-09C	13/13	18.8 - 482	1.8E+02	2.4E+02	N/A	N/A		NO	NUT, BBK
	7439-96-5	Manganese	5.9E+00	1.1E+04	MG/KG	IR85-SS17-00-01-09C	13/13	0.38 - 9.6	1.1E+04	1.4E+01	1.8E+02 N	6.5E+01	NCPSRG	YES	ASL
	7439-97-6	Mercury	3.7E-02	8.8E+00	MG/KG	IR85-SS18-00-01-09C	11/13	0.032 - 0.43	8.8E+00	8.1E-02	2.3E+00 N	1.0E+00	NCPSRG	YES	ASL
	7440-02-0	Nickel	9.1E-01	8.7E+00 J	MG/KG	IR85-SS17-00-01-09C	13/13	0.75 - 19.3	8.7E+00	1.2E+00	1.5E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	7.2E+01 J	1.4E+02	MG/KG	IR85-SS06-00-01-09C	9/13	75.2 - 1930	1.4E+02	1.2E+02	N/A	N/A		NO	NUT
	7782-49-2	Selenium	4.5E-01 J	4.5E-01 J	MG/KG	IR85-SS14-00-01-09C	1/13	1.5 - 38.5	4.5E-01	5.6E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL, BBK
	7440-22-4	Silver	8.3E-02 J	2.9E-01 J	MG/KG	IR85-SS16-00-01-09C	5/13	1.5 - 38.5	2.9E-01	1.4E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	3.2E+00 J	7.5E+00 J	MG/KG	IR85-SS09D-00-01-09C	7/13	188 - 4820	7.5E+00	8.1E+01	N/A	N/A		NO	NUT, BBK
	7440-28-0	Thallium	4.4E-01 J	1.9E+01 J	MG/KG	IR85-SS17-00-01-09C	2/13	2.3 - 57.8	1.9E+01	3.6E-01	N/A	N/A		NO	NTX
	7440-62-2	Vanadium	5.3E+00 J	1.0E+01 J	MG/KG	IR85-SS14D-00-01-09C	12/13	3.8 - 96.3	1.0E+01	8.9E+00	3.9E+01 N	N/A		NO	BSL
	7440-66-6	Zinc	4.2E+00	5.6E+03	MG/KG	IR85-SS17-00-01-09C	11/13	3.8 - 96.3	5.6E+03	1.1E+01	2.3E+03 N	1.2E+03	NCPSRG	YES	ASL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background surface soil concentrations.

Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL). May 17, 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.

RSL value for RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

J = Estimated Value

J- = Analyte present, value may be biased low, actual value may be higher

J+ = Analyte present, value may be biased high, actual value may be lower

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

NA = Not available/not applicable

ND = Non-detect

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),

Csat used as screening level.



**TABLE 2.11a**

Risk Ratio Screening for Surface Soil, Maximum Detected Concentration  
 Camp Johnson Site 85  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Antimony	1 / 13	5.9E+00 J-	IR85-SS18-00-01-09C	3.1E+01	1	0.2	NA	Longevity, Blood
Arsenic	13 / 13	9.9E+00 J	IR85-SS17-00-01-09C	3.9E-01	1E-06	NA	3E-05	NA
Chromium	12 / 13	8.5E+00 J	IR85-SS18-00-01-09C	2.9E-01	1E-06	NA	3E-05	NA
Cobalt	11 / 13	2.4E+00 J	IR85-SS17-00-01-09C	2.3E+01	1	0.1	NA	Thyroid
Iron	13 / 13	1.2E+04	IR85-SS18-00-01-09C	5.5E+04	1	0.2	NA	Gastrointestinal
<b>Lead</b>	<b>13 / 13</b>	<b>6.1E+02</b>	<b>IR85-SS18-00-01-09C</b>	<b>NA</b>		<b>NA</b>	<b>NA</b>	<b>NA</b>
<b>Manganese</b>	<b>13 / 13</b>	<b>1.1E+04</b>	<b>IR85-SS17-00-01-09C</b>	<b>1.8E+03</b>	<b>1</b>	<b>5.9</b>	<b>NA</b>	<b>Central Nervous System</b>
Mercury	11 / 13	8.8E+00	IR85-SS18-00-01-09C	2.3E+01	1	0.4	NA	Autoimmune
Zinc	11 / 13	5.6E+03	IR85-SS17-00-01-09C	2.3E+04	1	0.2	NA	Blood
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>7.1</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>5E-05</b>	
Total Autoimmune HI =							0.4	
Total Blood HI =							0.4	
Total Gastrointestinal HI =							0.2	
Total Longevity HI =							0.2	
Total Nervous System HI =							5.9	
Total Thyroid HI =							0.1	

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

J- = Analyte present, value may be biased low, actual value may be higher

mg/kg = milligrams per kilogram

NA = Not available/not applicable



**TABLE 2.11b**

Risk Ratio Screening for Surface Soil, 95% UCL Concentration  
 Camp Johnson Site 85  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	95% UCL	95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Lead	13 / 13	7.2E+01 6	Mean	NA	NA	NA	NA	
Manganese	13 / 13	9.1E+03 4	99% Cheb-m	1.8E+03	1	5.0	NA	Central Nervous System
Cumulative Corresponding Hazard Index <sup>c</sup>						5.0		
Cumulative Corresponding Cancer Risk <sup>d</sup>							NA	
Total Central Nervous System HI =								5.0

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.

<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable.

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010, ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).  
 Options: 99% Chebyshev (Mean, Sd) UCL (99% Cheb-m)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.
- (6) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
Site 85	71-55-6	1,1,1-Trichloroethane	ND	ND	MG/KG	IR85-SB11-2-7-09C	0/19	0.0016 - 0.0095	9.5E-03	N/A	6.4E+02 NS	1.2E+00	NCPSRG	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	5.6E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	9.1E+02 NS	9.2E+03	NCPSRG	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.1E+00 C	N/A	NCPSRG	NO	DLBSL
	75-34-3	1,1-Dichloroethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	3.3E+00 C	3.0E-02	NCPSRG	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	2.4E+01 N	4.6E-02	NCPSRG	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	2.0E-03 J	2.7E-03 J	MG/KG		5/19	0.0016 - 0.0095	2.7E-03	N/A	6.2E+00 C**	2.2E+00	NCPSRG	NO	BSL
	96-12-8	1,2-Dibromo-3-chloropropane	2.4E-03 J	2.4E-03 J	MG/KG		1/19	0.0016 - 0.0095	2.4E-03	N/A	5.4E-03 C	2.5E-04	NCPSRG	NO	BSL
	106-93-4	1,2-Dibromoethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	3.4E-02 C	9.7E-05	NCPSRG	NO	DLBSL
	95-50-1	1,2-Dichlorobenzene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.9E+02 N	2.4E-01	NCPSRG	NO	DLBSL
	107-06-2	1,2-Dichloroethane	ND	ND	MG/KG	IR85-SB11-2-7-09C	0/19	0.0016 - 0.0095	9.5E-03	N/A	4.3E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	78-87-5	1,2-Dichloropropane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	8.9E-01 C*	3.3E-03	NCPSRG	NO	DLBSL
	541-73-1	1,3-Dichlorobenzene	1.2E-03 J	1.4E-03 J	MG/KG		3/19	0.0016 - 0.0095	1.4E-03	N/A	2.4E+00 C	N/A	NCPSRG	NO	BSL
	106-46-7	1,4-Dichlorobenzene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	2.4E+00 C	7.0E-02	NCPSRG	NO	DLBSL
	78-93-3	2-Butanone	1.5E-03 J	2.7E-02 J	MG/KG		13/20	0.0029 - 0.019	2.7E-02	N/A	2.8E+03 N	1.6E+01	NCPSRG	NO	BSL
	591-78-6	2-Hexanone	ND	ND	MG/KG		0/19	0.0031 - 0.019	1.9E-02	N/A	2.1E+01 N	1.2E+00	NCPSRG	NO	DLBSL
	108-10-1	4-Methyl-2-pentanone	1.5E-03 J	1.5E-03 J	MG/KG		1/19	0.0031 - 0.019	1.5E-03	N/A	5.3E+02 N	N/A	NCPSRG	NO	BSL
	67-64-1	Acetone	3.0E-02 J	1.3E+00 J	MG/KG		20/22	0.0029 - 0.019	1.3E+00	N/A	6.1E+03 N	2.4E+01	NCPSRG	NO	BSL
	71-43-2	Benzene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.1E+00 C*	7.3E-02	NCPSRG	NO	DLBSL
	75-27-4	Bromodichloromethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	2.7E-01 C	2.9E-03	NCPSRG	NO	DLBSL
	75-25-2	Bromoform	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	6.1E+01 C*	1.9E-02	NCPSRG	NO	DLBSL
	74-83-9	Bromomethane	ND	ND	MG/KG		0/12	0.0035 - 0.019	1.9E-02	N/A	7.3E-01 N	N/A	NCPSRG	NO	DLBSL
	75-15-0	Carbon disulfide	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	8.2E+01 N	3.8E+00	NCPSRG	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	6.1E-01 C	2.0E-03	NCPSRG	NO	DLBSL
	108-90-7	Chlorobenzene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	2.9E+01 N	4.5E-01	NCPSRG	NO	DLBSL
	75-00-3	Chloroethane	ND	ND	MG/KG		0/18	0.0031 - 0.019	1.9E-02	N/A	1.5E+03 N	1.6E+01	NCPSRG	NO	DLBSL
	67-66-3	Chloroform	1.0E-03 J	1.0E-03 J	MG/KG		1/19	0.0016 - 0.0095	1.0E-03	N/A	2.9E-01 C	3.4E-01	NCPSRG	NO	BSL
	74-87-3	Chloromethane	ND	ND	MG/KG		0/19	0.0031 - 0.019	1.9E-02	N/A	1.2E+01 N	1.5E-02	NCPSRG	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	7.8E+01 N	3.6E-01	NCPSRG	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	110-82-7	Cyclohexane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.2E+02 NS	N/A	NCPSRG	NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	6.8E-01 C	1.9E-03	NCPSRG	NO	DLBSL
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.8E+01 N	2.9E+01	NCPSRG	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	5.4E+00 C	8.1E+00	NCPSRG	NO	DLBSL
	98-82-8	Isopropylbenzene	2.0E-03 J	2.7E-03 J	MG/KG	IR85-SB08-2-7-09C	5/19	0.0016 - 0.0095	2.7E-03	N/A	2.1E+02 N	1.3E+00	NCPSRG	NO	BSL
	79-20-9	Methyl acetate	1.2E-03 J	2.0E-01 J	MG/KG		16/20	0.0014 - 0.0095	2.0E-01	N/A	7.8E+03 N	N/A	NCPSRG	NO	BSL



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	108-87-2	Methylcyclohexane	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	5.7E+01 N	N/A		NO	DLBSL
	75-09-2	Methylene chloride	6.2E-04 J	1.4E-02 J	MG/KG	IR85-SS17-00-01-09C	9/20	0.0029 - 0.019	1.4E-02	N/A	1.1E+01 C	2.3E-02	NCPSRG	NO	BSL
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	4.3E+01 C	8.5E-02	NCPSRG	NO	DLBSL
	100-42-5	Styrene	2.1E-03 J	2.8E-03 J	MG/KG	IR85-SB08-2-7-09C	6/19	0.0016 - 0.0095	2.8E-03	N/A	6.3E+02 N	9.2E-01	NCPSRG	NO	BSL
	127-18-4	Tetrachloroethene	1.3E-03 J	1.6E-03 J	MG/KG	B08-2-7-09C : IR85-SB11-2	4/19	0.0016 - 0.0095	1.6E-03	N/A	5.5E-01 C	5.0E-03	NCPSRG	NO	BSL
	108-88-3	Toluene	6.4E-04 J	6.4E-04 J	MG/KG	IR85-SB17-6-7-09C	1/19	0.0016 - 0.0095	6.4E-04	N/A	5.0E+02 N	5.5E+00	NCPSRG	NO	BSL
	156-60-5	trans-1,2-Dichloroethene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.5E+01 N	5.1E-01	NCPSRG	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	1.7E+00 C*	2.3E-03	NCPSRG	NO	DLBSL
	79-01-6	Trichloroethene	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	2.8E+00 C	1.8E-02	NCPSRG	NO	DLBSL
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	7.9E+01 N	2.4E+01	NCPSRG	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	MG/KG		0/13	0.0033 - 0.019	1.9E-02	N/A	6.0E-02 C	1.9E-04	NCPSRG	NO	DLBSL
	1330-20-7	Xylene, total	ND	ND	MG/KG		0/19	0.0016 - 0.0095	9.5E-03	N/A	6.3E+01 N	6.0E+00	NCPSRG	NO	DLBSL
	92-52-4	1,1-Biphenyl	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.1E+02 NS	4.3E+01	NCPSRG	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	4.6E+00 C	N/A		NO	DLBSL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	105-67-9	2,4-Dimethylphenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.2E+02 N	1.4E+00	NCPSRG	NO	DLBSL
	51-28-5	2,4-Dinitrophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.2E+01 N	N/A		NO	DLBSL
	121-14-2	2,4-Dinitrotoluene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.6E+00 C*	N/A		NO	DLBSL
	606-20-2	2,6-Dinitrotoluene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+00 N	N/A		NO	DLBSL
	91-58-7	2-Chloronaphthalene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.8E+02 NS	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.9E+01 N	4.1E-03	NCPSRG	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	1.6E+00	NCPSRG	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.1E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.9E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.1E+00 C	N/A		NO	DLBSL
	99-09-2	3-Nitroaniline	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	4.9E-01 N	N/A		NO	DLBSL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.4E+00 C	N/A		NO	DLBSL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.1E+01 N	4.0E-01	NCPSRG	NO	DLBSL
	100-01-6	4-Nitroaniline	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.4E+01 C*	N/A		NO	DLBSL
	100-02-7	4-Nitrophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	83-32-9	Acenaphthene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.4E+02 N	8.4E+00	NCPSRG	NO	DLBSL



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	208-96-8	Acenaphthylene	ND	ND	MG/KG	IR85-SS06-00-01-09C	0/23	0.18 - 0.23	2.3E-01	N/A	3.4E+02 N	1.1E+01	NCPSRG	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.7E+03 N	6.6E+02	NCPSRG	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.1E+00 C	2.5E-02	NCPSRG	NO	DLBSL
	100-52-7	Benzaldehyde	ND	ND	MG/KG		0/13	0.18 - 0.23	2.3E-01	N/A	7.8E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	1.8E-01	NCPSRG	NO	DLBSL
	50-32-8	Benzo(a)pyrene	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	1.5E-02 C	5.9E-02	NCPSRG	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	6.0E-01	NCPSRG	NO	DLBSL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.7E+02 N	3.6E+02	NCPSRG	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.5E+00 C	5.9E+00	NCPSRG	NO	DLBSL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.8E+01 N	N/A		NO	DLBSL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.1E-01 C	1.4E-04	NCPSRG	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	2.9E-02 J	1.4E-01 J	MG/KG		4/23	0.18 - 0.23	1.4E-01	N/A	3.5E+01 C*	7.2E+00	NCPSRG	NO	BSL
	85-68-7	Butylbenzylphthalate	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.6E+02 C*	1.5E+02	NCPSRG	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.1E+03 N	1.8E+01	NCPSRG	NO	DLBSL
	86-74-8	Carbazole	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	N/A	N/A		NO	NTX
	218-01-9	Chrysene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.5E+01 C	1.8E+01	NCPSRG	NO	DLBSL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	1.5E-02 C	1.9E-01	NCPSRG	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	7.8E+00 N	4.7E+00	NCPSRG	NO	DLBSL
	84-66-2	Diethylphthalate	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	4.9E+03 N	3.7E+01	NCPSRG	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+02 N	1.9E+01	NCPSRG	NO	DLBSL
	117-84-0	Di-n-octylphthalate	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.5E+01 C*	3.8E+01	NCPSRG	NO	DLBSL
	206-44-0	Fluoranthene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.3E+02 N	3.3E+02	NCPSRG	NO	DLBSL
	86-73-7	Fluorene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	2.3E+02 N	5.6E+01	NCPSRG	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.0E-01 C	2.6E-03	NCPSRG	NO	DLBSL
	87-68-3	Hexachlorobutadiene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+00 C**	8.7E-03	NCPSRG	NO	DLBSL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	MG/KG		0/22	0.18 - 0.23	2.3E-01	N/A	3.7E+01 N	N/A		NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	6.1E+00 C**	N/A		NO	DLBSL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	1.5E-01 C	2.0E+00	NCPSRG	NO	DLBSL
	78-59-1	Isophorone	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	5.1E+02 C*	2.0E-01	NCPSRG	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.6E+00 C*	2.1E-01	NCPSRG	NO	DLBSL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	MG/KG		0/23	0.036 - 0.047	4.7E-02	N/A	6.9E-02 C	N/A		NO	DLBSL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	9.9E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	4.8E+00 C*	N/A		NO	DLBSL
	87-86-5	Pentachlorophenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	3.0E+00 C	3.1E-02	NCPSRG	NO	DLBSL
	85-01-8	Phenanthrene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.7E+03 N	5.7E+01	NCPSRG	NO	DLBSL



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	108-95-2	Phenol	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.8E+03 N	2.3E-01	NCPSRG	NO	DLBSL
	129-00-0	Pyrene	ND	ND	MG/KG		0/23	0.18 - 0.23	2.3E-01	N/A	1.7E+02 N	2.2E+02	NCPSRG	NO	DLBSL
	72-54-8	4,4'-DDD	3.9E-04 J	3.1E-03 J	MG/KG	IR85-SS18-00-01-09C	7/23	0.0017 - 0.0023	3.1E-03	N/A	2.0E+00 C	2.4E-01	NCPSRG	NO	BSL
	72-55-9	4,4'-DDE	6.4E-04 J	3.1E-02	MG/KG	IR85-SB07-2-4-09C	14/23	0.0017 - 0.0023	3.1E-02	N/A	1.4E+00 C	N/A		NO	BSL
	50-29-3	4,4'-DDT	6.8E-04 J	2.5E-02 J	MG/KG	IR85-SS18-00-01-09C	13/23	0.0017 - 0.0023	2.5E-02	N/A	1.7E+00 C*	3.4E-01	NCPSRG	NO	BSL
	309-00-2	Aldrin	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	2.9E-02 C*	N/A		NO	DLBSL
	319-84-6	alpha-BHC	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	7.7E-02 C	1.2E-03	NCPSRG	NO	DLBSL
	5103-71-9	alpha-Chlordane	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	DLBSL
	12674-11-2	Aroclor-1016	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	3.9E-01 N	N/A		NO	DLBSL
	11104-28-2	Aroclor-1221	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	11141-16-5	Aroclor-1232	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	1.4E-01 C	N/A		NO	DLBSL
	53469-21-9	Aroclor-1242	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	12672-29-6	Aroclor-1248	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	11097-69-1	Aroclor-1254	4.0E-02 J	5.0E-02	MG/KG	IR85-SS17-00-01-09C	2/23	0.017 - 0.023	5.0E-02	N/A	1.1E-01 C**	N/A		NO	BSL
	11096-82-5	Aroclor-1260	ND	ND	MG/KG		0/23	0.017 - 0.023	2.3E-02	N/A	2.2E-01 C	N/A		NO	DLBSL
	319-85-7	beta-BHC	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	DLBSL
	319-86-8	delta-BHC	1.1E-03 J	1.1E-03 J	MG/KG	IR85-SB13-2-7-09C	1/23	0.0017 - 0.0023	1.1E-03	N/A	2.7E-01 C	1.2E-03	NCPSRG	NO	BSL
	60-57-1	Dieldrin	1.9E-03 J	1.9E-03 J	MG/KG	IR85-SS17-00-01-09C	1/23	0.0017 - 0.0023	1.9E-03	N/A	3.0E-02 C	8.1E-04	NCPSRG	NO	BSL
	959-98-8	Endosulfan I	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	3.7E+01 N	5.6E+00	NCPSRG	NO	DLBSL
	72-20-8	Endrin	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	1.8E+00 N	8.1E-01	NCPSRG	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	5.2E-01 C*	1.8E-03	NCPSRG	NO	DLBSL
	5103-74-2	gamma-Chlordane	8.8E-04 J	2.7E-03 J	MG/KG	IR85-SS18-00-01-09C	3/23	0.0017 - 0.0023	2.7E-03	N/A	1.6E+00 C*	6.8E-02	NCPSRG	NO	BSL
	76-44-8	Heptachlor	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	1.1E-01 C	6.6E-03	NCPSRG	NO	DLBSL
	1024-57-3	Heptachlor epoxide	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	5.3E-02 C*	8.2E-04	NCPSRG	NO	DLBSL
	72-43-5	Methoxychlor	ND	ND	MG/KG		0/23	0.0017 - 0.0023	2.3E-03	N/A	3.1E+01 N	2.2E+01	NCPSRG	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	MG/KG		0/23	0.033 - 0.047	4.7E-02	N/A	4.4E-01 C	4.6E-02	NCPSRG	NO	DLBSL
	7429-90-5	Aluminum	3.0E+03 J+	1.2E+04	MG/KG	IR85-SB09-2-7-09C	23/23	75.2 - 1930	1.2E+04	5.5E+03	7.7E+03 N	N/A		YES	ASL
	7440-36-0	Antimony	5.9E+00 J-	5.9E+00 J-	MG/KG	IR85-SS18-00-01-09C	1/23	1.5 - 38.5	5.9E+00	3.6E-01	3.1E+00 N	N/A		YES	ASL
	7440-38-2	Arsenic	5.7E-01 J	9.9E+00 J	MG/KG	IR85-SS17-00-01-09C	23/23	1.5 - 38.5	9.9E+00	6.3E-01	3.9E-01 C*	5.8E+00	NCPSRG	YES	ASL
	7440-39-3	Barium	4.9E+00	3.1E+01 J	MG/KG	IR85-SS17-00-01-09C	22/23	3.8 - 96.3	3.1E+01	1.5E+01	1.5E+03 N	5.8E+02	NCPSRG	NO	BSL
	7440-41-7	Beryllium	2.4E-02 J	9.6E-02 J	MG/KG	IR85-SS18-00-01-09C	13/23	0.15 - 3.9	9.6E-02	1.0E-01	1.6E+01 N	N/A		NO	BSL, BBK
	7440-43-9	Cadmium	5.9E-01	3.5E+00	MG/KG	IR85-SS18-00-01-09C	3/23	0.45 - 11.6	3.5E+00	2.3E-02	7.0E+00 N	3.0E+00	NCPSRG	NO	BSL
	7440-70-2	Calcium	1.7E+01 J	4.7E+02	MG/KG	IR85-SS16-00-01-09C	10/23	75.2 - 1930	4.7E+02	4.4E+02	N/A	N/A		NO	NUT



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Surface and Subsurface Soil  
Exposure Medium: Surface and Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-47-3	Chromium	2.7E+00	1.3E+01	MG/KG	IR85-SB09-2-7-09C	22/23	1.5 - 38.5	1.3E+01	6.1E+00	2.9E-01 C	3.8E+00	NCPSRG	YES	ASL
	7440-48-4	Cobalt	1.1E-01 J	2.4E+00 J	MG/KG	IR85-SS17-00-01-09C	15/23	0.38 - 9.6	2.4E+00	2.9E-01	2.3E+00 N	N/A	NCPSRG	YES	ASL
	7440-50-8	Copper	5.4E-01 J	2.1E+02	MG/KG	IR85-SS18-00-01-09C	23/23	1.5 - 38.5	2.1E+02	2.6E+00	3.1E+02 N	7.0E+02	NCPSRG	NO	BSL
	7439-89-6	Iron	1.7E+03	1.2E+04	MG/KG	IR85-SS18-00-01-09C	23/23	11.3 - 289	1.2E+04	3.2E+03	5.5E+03 N	1.5E+02	NCPSRG	YES	ASL
	7439-92-1	Lead	2.8E+00	6.1E+02	MG/KG	IR85-SS18-00-01-09C	23/23	1.5 - 38.5	6.1E+02	8.5E+00	4.0E+02 NL	2.7E+02	NCPSRG	YES	ASL
	7439-95-4	Magnesium	8.1E+01 J	4.2E+02	MG/KG	IR85-SB09-2-7-09C	23/23	18.8 - 482	4.2E+02	2.4E+02	N/A	N/A	NCPSRG	NO	NUT
	7439-96-5	Manganese	4.5E+00	1.1E+04	MG/KG	IR85-SS17-00-01-09C	23/23	0.38 - 9.6	1.1E+04	9.3E+00	1.8E+02 N	6.5E+01	NCPSRG	YES	ASL
	7439-97-6	Mercury	3.5E-02	8.8E+00	MG/KG	IR85-SS18-00-01-09C	13/23	0.032 - 0.43	8.8E+00	7.1E-02	2.4E+00 N	1.0E+00	NCPSRG	YES	ASL
	7440-02-0	Nickel	7.6E-01 J	8.7E+00 J	MG/KG	IR85-SS17-00-01-09C	22/23	0.75 - 19.3	8.7E+00	1.2E+00	1.5E+02 N	1.3E+02	NCPSRG	NO	BSL
	7440-09-7	Potassium	7.2E+01 J	3.1E+02	MG/KG	IR85-SB09-2-7-09C	19/23	75.2 - 1930	3.1E+02	1.2E+02	N/A	N/A	NCPSRG	NO	NUT
	7782-49-2	Selenium	4.5E-01 J	4.7E-01 J	MG/KG	IR85-SB09-2-7-09C	2/23	1.5 - 38.5	4.7E-01	5.1E-01	3.9E+01 N	2.1E+00	NCPSRG	NO	BSL, BBK
	7440-22-4	Silver	8.3E-02 J	2.9E-01 J	MG/KG	IR85-SS16-00-01-09C	8/23	1.5 - 38.5	2.9E-01	1.3E-01	3.9E+01 N	3.4E+00	NCPSRG	NO	BSL
	7440-23-5	Sodium	3.2E+00 J	2.3E+01 J	MG/KG	IR85-SB09-2-7-09C	16/23	188 - 4820	2.3E+01	6.8E+01	N/A	N/A	NCPSRG	NO	NUT, BSL
	7440-28-0	Thallium	4.4E-01 J	1.9E+01 J	MG/KG	IR85-SS17-00-01-09C	2/23	2.3 - 57.8	1.9E+01	3.6E-01	N/A	N/A	NCPSRG	NO	NTX
	7440-62-2	Vanadium	5.3E+00 J	1.6E+01	MG/KG	IR85-SB09-2-7-09C	22/23	3.8 - 96.3	1.6E+01	8.9E+00	3.9E+01 N	N/A	NCPSRG	NO	BSL
	7440-66-6	Zinc	4.2E+00	5.6E+03	MG/KG	IR85-SS17-00-01-09C	17/23	3.8 - 96.3	5.6E+03	6.6E+00	2.3E+03 N	1.2E+03	NCPSRG	YES	ASL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are lower of two times the arithmetic mean basewide background surface soil or subsurface soil concentrations.

Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL), May 2010. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) residential soil RSLs.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for p-cresol used as surrogate for 3- and 4-methylphenol.

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for Mercury (inorganic salts) used for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

NCPSRG = North Carolina Preliminary Soil Remediation Goal, January, 2010

D = Compound identified in an analysis at a secondary dilution factor

J = Estimated Value

J- = Analyte present, value may be biased low, actual value may be higher

C = Carcinogenic

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

MG/KG = Milligrams per kilogram

N = Noncarcinogenic

N/A = Not available

ND = Non-detect

NL = Noncarcinogenic lead residential soil RSL not adjusted by dividing by 10.

NS = Concentration exceeds Csat (soil saturation concentration),

Csat used as screening level.



**TABLE 2.12a**

Risk Ratio Screening for Surface and Subsurface Soil, Maximum Detected Concentration  
 Camp Johnson Site 85  
 MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Metals (mg/kg)</b>								
Aluminum	23 / 23	1.2E+04	IR85-SB09-2-7-09C	7.7E+04	1	0.2	NA	Neurological
Antimony	1 / 23	5.9E+00 J-	IR85-SS18-00-01-09C	3.1E+01	1	0.2	NA	Longevity, Blood
Arsenic	23 / 23	9.9E+00 J	IR85-SS17-00-01-09C	3.9E-01	1E-06	NA	3E-05	NA
Chromium	22 / 23	1.3E+01	IR85-SB09-2-7-09C	2.9E-01	1E-06	NA	4E-05	NA
Cobalt	15 / 23	2.4E+00 J	IR85-SS17-00-01-09C	2.3E+01	1	0.1	NA	Thyroid
Iron	23 / 23	1.2E+04	IR85-SS18-00-01-09C	5.5E+04	1	0.2	NA	Gastrointestinal
Lead	23 / 23	6.1E+02	IR85-SS18-00-01-09C	NA	NA	NA	NA	NA
Manganese	23 / 23	1.1E+04	IR85-SS17-00-01-09C	1.8E+03	1	5.9	NA	Central Nervous System
Mercury	13 / 23	8.8E+00	IR85-SS18-00-01-09C	2.4E+01	1	0.4	NA	Autoimmune
Zinc	17 / 23	5.6E+03	IR85-SS17-00-01-09C	2.3E+04	1	0.2	NA	Blood
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						<b>7.2</b>		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							<b>7E-05</b>	
							Total Autoimmune HI =	0.4
							Total Blood HI =	0.4
							Total Developmental HI =	0.2
							Total Gastrointestinal HI =	0.2
							Total Longevity HI =	0.2
							Total Nervous System HI =	6.1
							Total Thyroid HI =	0.1

**Notes:**

<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level

<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.

<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.

<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

J- = Analyte present, value may be biased low, actual value may be higher

mg/kg = milligrams per kilogram

NA = Not available/not applicable



**TABLE 2.12b**

Risk Ratio Screening for Surface and Subsurface Soil, 95% UCL Concentration

Camp Johnson Site 85

MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL		95% UCL Rationale	Residential Soil RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte									
Metals (mg/kg)									
Aluminum	23 / 23	5.8E+03	1, 3	95% App-G	7.7E+04	1	0.1	NA	Neurological
Arsenic	23 / 23	3.3E+00	4	95% Cheb-m	3.9E-01	1E-06	NA	8E-06	NA
Chromium	22 / 23	5.9E+00	1, 3	95% KM-BCA	2.9E-01	1E-06	NA	2E-05	NA
Lead	23 / 23	4.3E+01	6	Mean	NA	NA	NA	NA	NA
Manganese	23 / 23	3.5E+03	4	97.5% Cheb-m	1.8E+03	1	1.9	NA	Central Nervous System
Cumulative Corresponding Hazard Index <sup>c</sup>							2.0		
Cumulative Corresponding Cancer Risk <sup>d</sup>								3E-05	
Total Nervous System HI =									2.0

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

mg/kg = milligrams per kilogram

HI = Hazard Index

NA = Not available/not applicable

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, May 2010. ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: 95% Approximate Gamma UCL (95% App-G); 95% Chebyshev (Mean, Sd) UCL (95% Cheb-m); 95% Kaplan-Meier (BCA) UCL (95% KM-BCA); 97.5% Chebyshev (Mean, Sd) UCL (97.5% Cheb-m)

Upper Confidence Limit (UCL) Rationale:

- (1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.
- (2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.
- (3) Test indicates data are gamma distributed.
- (4) Distribution tests are inconclusive
- (5) Max value used because 95% UCL greater than max.
- (6) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background Value [3]	Screening Toxicity Value [4]	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
Site 85	71-55-6	1,1,1-Trichloroethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	9.1E+02 N	2.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	UG/L		0/9	1 - 2.4	2.4E+00	N/A	6.7E-02 C	2.0E-01	15A NCAC 2L	YES	DLASL
	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	5.9E+03 N	2.0E+05	15A NCAC 2L	NO	DLBSL
	79-00-5	1,1,2-Trichloroethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	2.4E-01 C	5.0E+00	MCL	YES	DLASL
	75-34-3	1,1-Dichloroethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	2.4E+00 C	6.0E+00	15A NCAC 2L	NO	DLBSL
	75-35-4	1,1-Dichloroethene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	3.4E+01 N	7.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	120-82-1	1,2,4-Trichlorobenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.1E-01 C**	7.0E+01	MCL, 15A NCAC 2L	YES	DLASL
	96-12-8	1,2-Dibromo-3-chloropropane	ND	ND	UG/L		0/6	2 - 2	2.0E+00	N/A	3.2E-04 C	2.0E-01	MCL	YES	DLASL
												4.0E-02	15A NCAC 2L		
	106-93-4	1,2-Dibromoethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	6.5E-03 C	5.0E-02	MCL	YES	DLASL
												2.0E-02	15A NCAC 2L		
	95-50-1	1,2-Dichlorobenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	3.7E+01 N	6.0E+02	MCL	NO	DLBSL
												2.0E+01	15A NCAC 2L		
	107-06-2	1,2-Dichloroethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.5E-01 C	5.0E+00	MCL	YES	DLASL
												4.0E-01	15A NCAC 2L		
	78-87-5	1,2-Dichloropropane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	3.9E-01 C*	5.0E+00	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	541-73-1	1,3-Dichlorobenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.3E-01 C	2.0E+02	15A NCAC 2L	YES	DLASL
	106-46-7	1,4-Dichlorobenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.3E-01 C	7.5E+01	MCL	YES	DLASL
												6.0E+00	15A NCAC 2L		
	78-93-3	2-Butanone	ND	ND	UG/L		0/9	5 - 5	5.0E+00	N/A	7.1E+02 N	4.0E+03	15A NCAC 2L	NO	DLBSL
	591-78-6	2-Hexanone	ND	ND	UG/L		0/9	5 - 5	5.0E+00	N/A	4.7E+00 N	N/A		YES	DLASL
	108-10-1	4-Methyl-2-pentanone	ND	ND	UG/L		0/9	5 - 5	5.0E+00	N/A	2.0E+02 N	N/A		NO	DLBSL
	67-64-1	Acetone	ND	ND	UG/L		0/9	5 - 5	5.0E+00	N/A	2.2E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	71-43-2	Benzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.1E-01 C	5.0E+00	MCL	YES	DLASL
												1.0E+00	15A NCAC 2L		
	75-27-4	Bromodichloromethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.2E-01 C	8.0E+01	MCL	YES	DLASL
												6.0E-01	15A NCAC 2L		
	75-25-2	Bromoform	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	8.5E+00 C*	8.0E+01	MCL	NO	DLBSL
												4.0E+00	15A NCAC 2L		
	74-83-9	Bromomethane	ND	ND	UG/L		0/8	1 - 1.1	1.1E+00	N/A	8.7E-01 N	N/A		YES	DLASL
	75-15-0	Carbon disulfide	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.0E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	56-23-5	Carbon tetrachloride	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.4E-01 C	5.0E+00	MCL	YES	DLASL
												3.0E-01	15A NCAC 2L		
	108-90-7	Chlorobenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	9.1E+00 N	1.0E+02	MCL	NO	DLBSL
												5.0E+01	15A NCAC 2L		



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Deletion or Selection [5]
	75-00-3 <b>67-66-3</b>	Chloroethane <b>Chloroform</b>	ND <b>6.2E+00</b>	ND <b>1.1E+01 J</b>	UG/L <b>UG/L</b>	<b>IR85-MW05-09C</b>	0/8 <b>2/9</b>	1 - 1 <b>1 - 1</b>	1.0E+00 <b>1.1E+01</b>	N/A <b>N/A</b>	2.1E+03 N <b>1.9E-01 C</b>	3.0E+03 <b>8.0E+01</b>	15A NCAC 2L <b>MCL</b>	NO <b>YES</b>	DLBSL <b>ASL</b>
	74-87-3	Chloromethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.9E+01 N	3.0E+00	15A NCAC 2L	NO	DLBSL
	156-59-2	cis-1,2-Dichloroethene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	3.7E+01 N	7.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	10061-01-5	cis-1,3-Dichloropropene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	110-82-7	Cyclohexane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.3E+03 N	N/A		NO	DLBSL
	124-48-1	Dibromochloromethane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.5E-01 C	6.0E+01	MCL	YES	DLASL
											4.0E-01	15A NCAC 2L			
	75-71-8	Dichlorodifluoromethane (Freon-12)	ND	ND	UG/L	<b>IR85-TW06-09C</b>	0/9	1 - 1	1.0E+00	N/A	3.9E+01 N	1.0E+03	15A NCAC 2L	NO	DLBSL
	100-41-4	Ethylbenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.5E+00 C	7.0E+02	MCL	NO	DLBSL
											6.0E+02	15A NCAC 2L			
	98-82-8	Isopropylbenzene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	6.8E+01 N	7.0E+01	15A NCAC 2L	NO	DLBSL
	79-20-9	Methyl acetate	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	3.7E+03 N	N/A		NO	DLBSL
	108-87-2	Methylcyclohexane	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	8.8E+01 N	N/A		NO	DLBSL
	<b>75-09-2</b>	<b>Methylene chloride</b>	<b>1.4E+01 J</b>	<b>1.9E+02</b>	<b>UG/L</b>		<b>2/9</b>	<b>1 - 1</b>	<b>1.9E+02</b>	<b>N/A</b>	<b>4.8E+00 C</b>	<b>5.0E+00</b>	<b>MCL, 15A NCAC 2L</b>	<b>YES</b>	<b>ASL</b>
	1634-04-4	Methyl-tert-butyl ether (MTBE)	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.2E+01 C	2.0E+01	15A NCAC 2L	NO	DLBSL
	100-42-5	Styrene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.6E+02 N	1.0E+02	MCL	NO	DLBSL
											7.0E+01	15A NCAC 2L			
	127-18-4	Tetrachloroethene	ND	ND	UG/L		0/9	1 - 1.1	1.1E+00	N/A	1.1E-01 C	5.0E+00	MCL	YES	DLASL
											7.0E-01	15A NCAC 2L			
	108-88-3	Toluene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	2.3E+02 N	1.0E+03	MCL	NO	DLBSL
											6.0E+02	15A NCAC 2L			
	156-60-5	trans-1,2-Dichloroethene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.1E+01 N	1.0E+02	MCL, 15A NCAC 2L	NO	DLBSL
	10061-02-6	trans-1,3-Dichloropropene	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	4.3E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	79-01-6	Trichloroethene	ND	ND	UG/L		0/9	1 - 5.1	5.1E+00	N/A	2.0E+00 C	5.0E+00	MCL	YES	DLASL
											3.0E+00	15A NCAC 2L			
	75-69-4	Trichlorofluoromethane(Freon-11)	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.3E+02 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	75-01-4	Vinyl chloride	ND	ND	UG/L		0/9	1 - 1	1.0E+00	N/A	1.6E-02 C	2.0E+00	MCL	YES	DLASL
											3.0E-02	15A NCAC 2L			
	1330-20-7	Xylene, total	ND	ND	UG/L		0/9	1 - 1.2	1.2E+00	N/A	2.0E+01 N	1.0E+04	MCL	NO	DLBSL
											5.0E+02	15A NCAC 2L			
	92-52-4	1,1-Biphenyl	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+02 N	4.0E+02	15A NCAC 2L	NO	DLBSL
	108-60-1	2,2'-Oxybis(1-chloropropane)	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.2E-01 C	N/A		YES	DLASL
	95-95-4	2,4,5-Trichlorophenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-83-2	2,4-Dichlorophenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+01 N	N/A		YES	DLASL
	105-67-9	2,4-Dimethylphenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	7.3E+01 N	1.0E+02	15A NCAC 2L	NO	DLBSL



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	51-28-5	2,4-Dinitrophenol	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	7.3E+00 N	N/A		YES	DLASL
	121-14-2	2,4-Dinitrotoluene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.2E-01 C	N/A		YES	DLASL
	606-20-2	2,6-Dinitrotoluene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	91-58-7	2-Chloronaphthalene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E+02 N	N/A		NO	DLBSL
	95-57-8	2-Chlorophenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+01 N	4.0E-01	15A NCAC 2L	NO	DLBSL
	91-57-6	2-Methylnaphthalene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.5E+01 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	95-48-7	2-Methylphenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+02 N	N/A		NO	DLBSL
	88-74-4	2-Nitroaniline	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	88-75-5	2-Nitrophenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	91-94-1	3,3'-Dichlorobenzidine	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	1.5E-01 C	N/A		YES	DLASL
	99-09-2	3-Nitroaniline	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+01 N	N/A		NO	DLBSL
	534-52-1	4,6-Dinitro-2-methylphenol	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	2.9E-01 N	N/A		YES	DLASL
	101-55-3	4-Bromophenyl-phenylether	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX
	59-50-7	4-Chloro-3-methylphenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	106-47-8	4-Chloroaniline	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.4E-01 C	N/A		YES	DLASL
	7005-72-3	4-Chlorophenyl-phenylether	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+01 N	N/A		NO	DLBSL
	106-44-5	4-Methylphenol	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	1.8E+01 N	4.0E+01	15A NCAC 2L	YES	DLASL
	100-01-6	4-Nitroaniline	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.4E+00 C*	N/A		YES	DLASL
	100-02-7	4-Nitrophenol	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	83-32-9	Acenaphthene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.2E+02 N	8.0E+01	15A NCAC 2L	NO	DLBSL
	208-96-8	Acenaphthylene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.2E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	98-86-2	Acetophenone	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	120-12-7	Anthracene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+03 N	2.0E+03	15A NCAC 2L	NO	DLBSL
	1912-24-9	Atrazine	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	2.9E-01 C	3.0E+00	MCL, 15A NCAC 2L	YES	DLASL
	100-52-7	Benzaldehyde	ND	ND	UG/L		0/4	10 - 10	1.0E+01	N/A	3.7E+02 N	N/A		NO	DLBSL
	56-55-3	Benzo(a)anthracene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	50-32-8	Benzo(a)pyrene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-03 C	2.0E-01	MCL	YES	DLASL
	205-99-2	Benzo(b)fluoranthene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	191-24-2	Benzo(g,h,i)perylene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	207-08-9	Benzo(k)fluoranthene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-01 C	5.0E-01	15A NCAC 2L	YES	DLASL
	111-91-1	bis(2-Chloroethoxy)methane	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+01 N	N/A		YES	DLASL
	111-44-4	bis(2-Chloroethyl)ether	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.2E-02 C	3.0E-02	15A NCAC 2L	YES	DLASL
	117-81-7	bis(2-Ethylhexyl)phthalate	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	4.8E+00 C	6.0E+00	MCL	YES	DLASL
	85-68-7	Butylbenzylphthalate	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.5E+01 C	1.0E+03	15A NCAC 2L	NO	DLBSL
	105-60-2	Caprolactam	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.8E+03 N	4.0E+03	15A NCAC 2L	NO	DLBSL
	86-74-8	Carbazole	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	218-01-9	Chrysene	ND	ND	UG/L	IR85-TW06-09C	0/9	10 - 11	1.1E+01	N/A	2.9E+00 C	5.0E+00	15A NCAC 2L	YES	DLASL
	53-70-3	Dibenz(a,h)anthracene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-03 C	5.0E-03	15A NCAC 2L	YES	DLASL
	132-64-9	Dibenzofuran	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+00 N	N/A		YES	DLASL
	84-66-2	Diethylphthalate	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E+03 N	6.0E+03	15A NCAC 2L	NO	DLBSL
	131-11-3	Dimethyl phthalate	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	N/A	N/A		NO	NTX
	84-74-2	Di-n-butylphthalate	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	3.7E+02 N	7.0E+02	15A NCAC 2L	NO	DLBSL
	117-84-0	Di-n-octylphthalate	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	4.8E+00 C	1.0E+02	15A NCAC 2L	YES	DLASL
	206-44-0	Fluoranthene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	86-73-7	Fluorene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.5E+02 N	3.0E+02	15A NCAC 2L	NO	DLBSL
	118-74-1	Hexachlorobenzene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	4.2E-02 C	1.0E+00	MCL	YES	DLASL
											2.0E-02		15A NCAC 2L		
	87-68-3	Hexachlorobutadiene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	8.6E-01 C*	4.0E-01	15A NCAC 2L	YES	DLASL
	77-47-4	Hexachlorocyclopentadiene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.2E+01 N	5.0E+01	MCL	NO	DLBSL
	67-72-1	Hexachloroethane	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	3.7E+00 C**	N/A		YES	DLASL
	193-39-5	Indeno(1,2,3-cd)pyrene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	2.9E-02 C	5.0E-02	15A NCAC 2L	YES	DLASL
	78-59-1	Isophorone	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	7.1E+01 C	4.0E+01	15A NCAC 2L	NO	DLBSL
	91-20-3	Naphthalene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.4E-01 C*	6.0E+00	15A NCAC 2L	YES	DLASL
	621-64-7	n-Nitroso-di-n-propylamine	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	9.6E-03 C	N/A		YES	DLASL
	86-30-6	n-Nitrosodiphenylamine	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.4E+01 C	N/A		NO	DLBSL
	98-95-3	Nitrobenzene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.2E-01 C	N/A		YES	DLASL
	87-86-5	Pentachlorophenol	ND	ND	UG/L		0/9	20 - 21	2.1E+01	N/A	5.6E-01 C	1.0E+00	MCL	YES	DLASL
											3.0E-01		15A NCAC 2L		
	85-01-8	Phenanthrene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+03 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	108-95-2	Phenol	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+03 N	3.0E+01	15A NCAC 2L	NO	DLBSL
	129-00-0	Pyrene	ND	ND	UG/L		0/9	10 - 11	1.1E+01	N/A	1.1E+02 N	2.0E+02	15A NCAC 2L	NO	DLBSL
	72-54-8	4,4'-DDD	7.9E-02 J	7.9E-02 J	UG/L		1/9	0.05 - 0.078	7.9E-02	N/A	2.8E-01 C	1.0E-01	15A NCAC 2L	NO	BSL
	72-55-9	4,4'-DDE	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	2.0E-01 C	N/A		NO	DLBSL
	50-29-3	4,4'-DDT	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	2.0E-01 C*	1.0E-01	15A NCAC 2L	NO	DLBSL
	309-00-2	Aldrin	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	4.0E-03 C	N/A		YES	DLASL
	319-84-6	alpha-BHC	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.1E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	5103-71-9	alpha-Chlordane	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.9E-01 C*	2.0E+00	MCL	NO	DLBSL
											1.0E-01		15A NCAC 2L		
	12674-11-2	Aroclor-1016	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	2.6E-01 C**	5.0E-01	MCL	YES	DLASL
	11104-28-2	Aroclor-1221	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	11141-16-5	Aroclor-1232	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	6.8E-03 C	5.0E-01	MCL	YES	DLASL
	53469-21-9	Aroclor-1242	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	12672-29-6	Aroclor-1248	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	11097-69-1	Aroclor-1254	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	3.4E-02 C*	5.0E-01	MCL	YES	DLASL



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection [5]
	11096-82-5	Aroclor-1260	ND	ND	UG/L		0/9	0.5 - 0.78	7.8E-01	N/A	3.4E-02 C	5.0E-01	MCL	YES	DLASL
	319-85-7	beta-BHC	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	319-86-8	delta-BHC	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	3.7E-02 C	2.0E-02	15A NCAC 2L	YES	DLASL
	60-57-1	Dieldrin	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	4.2E-03 C	2.0E-03	15A NCAC 2L	YES	DLASL
	959-98-8	Endosulfan I	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	33213-65-9	Endosulfan II	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	1031-07-8	Endosulfan sulfate	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	2.2E+01 N	4.0E+01	15A NCAC 2L	NO	DLBSL
	72-20-8	Endrin	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.1E+00 N	2.0E+00	MCL, 15A NCAC 2L	NO	DLBSL
	7421-93-4	Endrin aldehyde	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	53494-70-5	Endrin ketone	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.1E+00 N	2.0E+00	15A NCAC 2L	NO	DLBSL
	58-89-9	gamma-BHC (Lindane)	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	6.1E-02 C	2.0E-01	MCL	YES	DLASL
												3.0E-02	15A NCAC 2L		
	5103-74-2	gamma-Chlordane	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.9E-01 C*	2.0E+00	MCL	NO	DLBSL
												1.0E-01	15A NCAC 2L		
	76-44-8	Heptachlor	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.5E-02 C	4.0E-01	MCL	YES	DLASL
												8.0E-03	15A NCAC 2L		
	1024-57-3	Heptachlor epoxide	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	7.4E-03 C*	2.0E-01	MCL	YES	DLASL
												4.0E-03	15A NCAC 2L		
	72-43-5	Methoxychlor	ND	ND	UG/L		0/9	0.05 - 0.078	7.8E-02	N/A	1.8E+01 N	4.0E+01	MCL, 15A NCAC 2L	NO	DLBSL
	8001-35-2	Toxaphene	ND	ND	UG/L		0/9	1 - 1.6	1.6E+00	N/A	6.1E-02 C	3.0E+00	MCL	YES	DLASL
												3.0E-02	15A NCAC 2L		
	<b>7429-90-5</b>	<b>Aluminum</b>	<b>1.1E+02 J</b>	<b>1.5E+04</b>	<b>UG/L</b>	<b>IR85-TW06-09C</b>	<b>9/9</b>	<b>1000 - 1000</b>	<b>1.5E+04</b>	<b>1.9E+03</b>	<b>3.7E+03 N</b>	<b>50 - 200</b>	<b>SMCL</b>	<b>YES</b>	<b>ASL</b>
	7440-36-0	Antimony	ND	ND	UG/L		0/9	20 - 40	4.0E+01	3.3E+00	1.5E+00 N	6.0E+00	MCL	YES	DLASL
	7440-38-2	Arsenic	2.0E+00 J	2.0E+00 J	UG/L	IR85-MW02-09C	1/9	20 - 20	2.0E+00	5.8E+00	4.5E-02 C	1.0E+01	MCL, 15A NCAC 2L	NO	BBK
	7440-39-3	Barium	2.4E+01 J	5.7E+01	UG/L	IR85-MW02-09C	5/9	50 - 50	5.7E+01	8.6E+01	7.3E+02 N	2.0E+03	MCL	NO	BSL, BBK
												7.0E+02	15A NCAC 2L		
	7440-41-7	Beryllium	9.8E-02 J	2.7E-01 J	UG/L	IR85-MW02-09C	5/9	2 - 2	2.7E-01	3.1E-01	7.3E+00 N	4.0E+00	MCL	NO	BSL, BBK
	7440-43-9	Cadmium	1.4E-01 J	2.8E-01 J	UG/L	IR85-TW08-09C	3/9	6 - 6	2.8E-01	3.6E-01	1.8E+00 N	5.0E+00	MCL	NO	BSL, BBK
												2.0E+00	15A NCAC 2L		
	7440-70-2	Calcium	5.7E+02 J	3.2E+03	UG/L	IR85-TW06-09C	9/9	1000 - 1000	3.2E+03	6.9E+04	N/A	N/A		NO	NUT, BSL
	<b>7440-47-3</b>	<b>Chromium</b>	<b>1.8E+00 J</b>	<b>1.9E+01 J</b>	<b>UG/L</b>	<b>IR85-TW06-09C</b>	<b>2/9</b>	<b>20 - 20</b>	<b>1.9E+01</b>	<b>3.1E+00</b>	<b>4.3E-02 C</b>	<b>1.0E+02</b>	<b>MCL</b>	<b>YES</b>	<b>ASL</b>
												1.0E+01	15A NCAC 2L		
	7440-48-4	Cobalt	6.4E-01 J	1.2E+00 J	UG/L	IR85-TW05-09C	5/9	5 - 5	1.2E+00	3.4E+00	1.1E+00 N	N/A		NO	BBK
	7440-50-8	Copper	2.4E+00 J	6.8E+00 J	UG/L	IR85-TW06-09C	5/9	20 - 40	6.8E+00	2.8E+00	1.5E+02 N	1.3E+03	MCL	NO	BSL
												1.0E+03	15A NCAC 2L		
	<b>7439-89-6</b>	<b>Iron</b>	<b>1.1E+02 J</b>	<b>6.9E+03</b>	<b>UG/L</b>	<b>IR85-TW06-09C</b>	<b>9/9</b>	<b>150 - 150</b>	<b>6.9E+03</b>	<b>6.0E+03</b>	<b>2.6E+03 N</b>	<b>3.0E+02</b>	<b>SMCL, 15A NCAC 2L</b>	<b>YES</b>	<b>ASL</b>
	<b>7439-92-1</b>	<b>Lead</b>	<b>2.4E+00 J</b>	<b>1.6E+01 J</b>	<b>UG/L</b>	<b>IR85-TW06-09C</b>	<b>3/9</b>	<b>20 - 40</b>	<b>1.6E+01</b>	<b>2.8E+00</b>	<b>N/A</b>	<b>1.5E+01</b>	<b>MCL, 15A NCAC 2L</b>	<b>YES</b>	<b>ASL</b>
	<b>7439-95-4</b>	<b>Magnesium</b>	<b>3.8E+02</b>	<b>2.5E+03</b>	<b>UG/L</b>	<b>IR85-TW05-09C</b>	<b>9/9</b>	<b>250 - 250</b>	<b>2.5E+03</b>	<b>6.4E+03</b>	<b>N/A</b>	<b>N/A</b>		<b>NO</b>	<b>NUT, BSL</b>



Table 2.12  
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN  
Camp Johnson Site 85  
MCB Camp Lejeune, North Carolina

Scenario Timeframe: Future  
Medium: Groundwater  
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-96-5	Manganese	4.2E+00 J	7.3E+01	UG/L	IR85-TW05-09C	9/9	5 - 5	7.3E+01	2.1E+02	8.8E+01 N	5.0E+01	SMCL, 15A NCAC 2L	NO	BSL, BBK
	7439-97-6	Mercury	3.6E-02 J	8.5E-02 J	UG/L	IR85-MW02-09C	2/9	0.2 - 0.2	8.5E-02	1.0E-01	1.1E+00 N	2.0E+00	MCL	NO	BSL, BBK
	7440-02-0	Nickel	1.2E+00 J	2.0E+01	UG/L	IR85-TW05-09C	7/9	10 - 10	2.0E+01	8.0E+00	7.3E+01 N	1.0E+02	15A NCAC 2L	NO	BSL
	7440-09-7	Potassium	5.0E+02 J	2.2E+03	UG/L	IR85-MW02-09C	9/9	1000 - 1000	2.2E+03	3.3E+03	N/A	N/A		NO	NUT, BSL
	7782-49-2	Selenium	4.3E+00 J	4.3E+00 J	UG/L	IR85-TW05-09C	1/9	20 - 20	4.3E+00	3.1E+00	1.8E+01 N	5.0E+01	MCL	NO	BSL
	7440-22-4	Silver	1.5E+00 J	1.5E+00 J	UG/L	IR85-TW04-09C	1/9	20 - 20	1.5E+00	7.7E-01	1.8E+01 N	2.0E+01	15A NCAC 2L	NO	BSL
	7440-23-5	Sodium	2.8E+03	2.7E+04	UG/L	IR85-TW06-09C	9/9	2500 - 2500	2.7E+04	2.3E+04	N/A	1.0E+02	SMCL	NO	NUT
	7440-28-0	Thallium	ND	ND	UG/L		0/9	30 - 30	3.0E+01	3.8E+00	N/A	2.0E+00	MCL	NO	NTX
	7440-62-2	Vanadium	ND	ND	UG/L		0/9	50 - 100	1.0E+02	4.7E+00	1.8E+01 N	N/A		YES	DLASL
	7440-66-6	Zinc	4.4E+00 J	1.1E+02	UG/L	IR85-TW08-09C	7/9	50 - 100	1.1E+02	4.2E+01	1.1E+03 N	1.0E+03	15A NCAC 2L	NO	BSL
												5.0E+03	SMCL		

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening. If the chemical was not detected, the maximum detection limit is used for screening.

[3] Background values are two times the arithmetic mean basewide background shallow groundwater concentrations. Background values are from *Final Base Background Soil Study Report, Marine Corps Base Camp Lejeune, North Carolina*, Baker Environmental, April 25, 2001.

[4] Oak Ridge National Laboratory (ORNL), May 17, 2010. Regional Screening Levels for Chemical Contaminants at Superfund Sites.

<http://epa-prgs.ornl.gov/chemicals/index.shtml>. Adjusted (noncarcinogenic RSLs adjusted by dividing by 10) tap water RSLs.

RSL value for n-Hexane used as surrogate for Methylcyclohexane.

RSL value for 1,4-Dichlorobenzene used as a surrogate for 1,3-Dichlorobenzene

RSL value for 2-Nitroaniline used as surrogate for 3-Nitroaniline.

RSL value for methoxychlor used as surrogate for 4-chlorophenyl-phenylether.

RSL value for nitrobenzene used as surrogate for 4-nitrophenol.

RSL value for acenaphthene used as surrogate for acenaphthylene.

RSL value for pyrene used as surrogate for benzo(g,h,i)perylene.

RSL value for anthracene used as surrogate for phenanthrene.

RSL value for technical chlordane used as surrogate for alpha-chlordane.

RSL value for technical-HCH used as surrogate for delta-BHC.

RSL value for technical chlordane used as surrogate for gamma-chlordane.

RSL value for 1,3-dichloropropene used as a surrogate for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

RSL value for endosulfan used as surrogate for endosulfan I, endosulfan II, and endosulfan sulfate.

RSL value for endrin used as surrogate for endrin aldehyde and endrin ketone.

RSL value for 2-chlorophenol used as surrogate for 4-chloro-3-methylphenol and 2-nitrophenol.

RSL value for chromium VI used for total chromium.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)  
Detection Limit Above Screening Level (DLASL), not quantitatively evaluated in HHRA  
Deletion Reason: No Toxicity Information (NTX)  
Essential Nutrient (NUT)  
Below Screening Level (BSL)  
Below Background (BBK)  
Detection Limit Below Screening Level (DLBSL)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/  
To Be Considered

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards

SMCL = Secondary Maximum Contaminant Level

15A NCAC 2L = North Carolina Classifications and Groundwater Quality Standards,  
January 2010.

J = Estimated Value

C\* = N screening level < 100x C screening level, therefore

N screening value/10 used as screening level

C\*\* = N screening level < 10x C screening level, therefore

N screening value/10 used as screening level

N = Noncarcinogenic

N/A = Not available/not applicable

ND = Not detected

UG/L = Micrograms per liter



**TABLE 2.13a**

Risk Ratio Screening for Groundwater, Maximum Detected Concentration

Camp Johnson Site 85

MCB Camp Lejeune, North Carolina

Analyte	Detection Frequency	Maximum Detected Concentration (Qualifier)	Sample Location of Maximum Detected Concentration	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
<b>Volatile Organic Compounds (ug/L)</b>								
Chloroform	2 / 9	1.1E+01 J	IR85-MW05-09C	1.9E-01	1E-06	NA	6E-05	NA
Methylene Chloride	2 / 9	1.9E+02	IR85-TW06-09C	4.8E+00	1E-06	NA	4E-05	NA
<b>Metals (ug/L)</b>								
Aluminum	9 / 9	1.5E+04	IR85-TW06-09C	3.7E+04	1	0.4	NA	Neurological
Chromium	2 / 9	1.9E+01 J	IR85-TW06-09C	4.3E-02	1E-06	NA	4E-04	NA
Iron	9 / 9	6.9E+03	IR85-TW06-09C	2.6E+04	1	0.3		Gastrointestinal
Lead	3 / 9	1.6E+01 J	IR85-TW06-09C	NA	NA	NA	NA	
<b>Cumulative Corresponding Hazard Index<sup>c</sup></b>						0.7		
<b>Cumulative Corresponding Cancer Risk<sup>d</sup></b>							5E-04	
						Total Gastrointestinal HI =		0.3
						Total Neurological HI =		0.4

**Notes:**<sup>a</sup> Corresponding Hazard Index equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals maximum detected concentration divided by the RSL divided by the acceptable risk level.<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

J = Estimated Value

ug/L = micrograms per liter

NA = Not available/not applicable



**TABLE 2.13b**

Risk Ratio Screening for Groundwater, 95% UCL Concentration

Camp Johnson Site 85

MCB Camp Lejeune, North Carolina

	Detection Frequency	95% UCL		95% UCL Rationale	Tap Water RSL	Acceptable Risk Level	Corresponding Hazard Index <sup>a</sup>	Corresponding Cancer Risk <sup>b</sup>	Target Organ
Analyte									
Volatile Organic Compounds (ug/L)									
Chloroform	2 / 9	8.1E+00	95% KM-t	4	1.9E-01	1E-06	NA	4E-05	NA
Methylene Chloride	2 / 9	1.9E+02	Max	4, 5	4.8E+00	1E-06	NA	4E-05	NA
Metals (ug/L)									
Chromium	2 / 9	1.9E+01	Max	4, 5	4.3E-02	1E-06	NA	4E-04	NA
Lead	3 / 9	1.0E+01	Mean	6	NA	NA	NA	NA	Gastrointestinal
Cumulative Corresponding Hazard Index <sup>c</sup>							0.0		
Cumulative Corresponding Cancer Risk <sup>d</sup>								5E-04	
Total Gastrointestinal HI =								NA	

**Notes:**<sup>a</sup> Corresponding Hazard Index equals 95% UCL concentration divided by the RSL divided by the acceptable risk level.<sup>b</sup> Corresponding Cancer Risk equals 95% UCL concentration divided by the RSL divided by the acceptable risk level<sup>c</sup> Cumulative Corresponding Hazard Index equals sum of Corresponding Hazard Indices for each constituent.<sup>d</sup> Cumulative Corresponding Cancer Risk equals sum of Corresponding Cancer Risks for each constituent.

Constituent selected as COPC if it contributes to an overall Hazard Index by target organ greater than 0.5 or Cumulative Corresponding Cancer Risk greater than 5E-05, otherwise, constituent not selected as COPC.

Constituents selected as COPCs are indicated by shading.

COPC = Chemical of Potential Concern

HI = Hazard Index

NA = Not available/not applicable.

ug/L = micrograms per liter

ProUCL, Version 4.00.05 used to determine distribution of data and calculate 95% UCL, following recommendations in users guide (USEPA, March 2010, ProUCL, Version 4.0. Prepared by Lockheed Martin Environmental Services).

Options: Maximum detected concentration (Max); 95% Kaplan-Meier (t) UCL (95% KM-t); Arithmetic Mean (Mean)

Upper Confidence Limit (UCL) Rationale:

(1) Shapiro-Wilk W Test/Lilliefors test indicates data are log-normally distributed.

(2) Shapiro-Wilk W Test/Lilliefors indicates data are normally distributed.

(3) Test indicates data are gamma distributed.

(4) Distribution tests are inconclusive

(5) Max value used because 95% UCL greater than max.

(6) Lead evaluated using arithmetic mean concentration in lead models, therefore, arithmetic mean concentration presented here.



Appendix F  
Ecological Risk Screening Information

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Table F-1  
ERS Surface Soil Screen for UXO-20  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum HQ	Arithmetic Mean Concentration	Mean HQ	2 x Mean Background	Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value HQ	Retain?	Rationale
Inorganics (MG/KG)																
Antimony	1.50 - 17.8	16 / 214	0.49	CJCA-SS163-09C	0.27	3 / 214	1.8	1.04	3.85	0.447	Yes	--	--	--	No	Within range of background
Arsenic	1.60 - 17.8	201 / 214	6.90	CJCA-SS136-09C	18.0	0 / 214	0.38	1.39	0.08	0.626	Yes	--	--	--	No	HQ less than one, detected
Copper	0.83 - 8.90	203 / 214	26.1	CJCA-SS033-09C	28.0	0 / 214	0.93	1.58	0.06	4.83	Yes	--	--	--	No	HQ less than one, detected
Lead	-- - --	214 / 214	115	CJCA-SS033-09C	11.0	25 / 214	10.5	7.86	0.71	12.3	Yes	50	Region 4 (EPA, 2001)	2.3	No	Low frequency and magnitude of exceedance based on supplemental screening value.
Zinc	1.70 - 17.1	158 / 214	117	CJCA-SS041-09C	46.0	3 / 214	2.5	5.74	0.12	10.8	Yes	--	--	--	No	Low frequency and magnitude of exceedance. Mean HQ less than one.

NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
HQ - Hazard Quotient  
MG/KG - Milligrams per kilogram  
NSV - No Screening Value  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-2  
ERS Subsurface Soil Screen for UXO-20  
Camp Johnson Consutrcion Area  
Focused PA/SI  
*MCB Camp Lejeune, North Carolina*

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Exceeds 2 x Mean Background?	Retain?	Rationale
Inorganics (MG/KG)													
Antimony	1.50 - 3.50	1 / 67	0.21	CJCA-SB02-2-6-09C	0.27	0 / 67	0.78	0.88	3.25	0.36	No	No	Consistent with background
Arsenic	1.50 - 3.00	59 / 67	24.8	CJCA-SB78-4-6-09C	18.0	4 / 67	1.38	5.94	0.33	2.12	Yes	No	Low magnitude and frequency of exceedance
Copper	1.50 - 2.70	62 / 67	6.90	CJCA-SB09-2-4-09C	28.0	0 / 67	0.25	2.10	0.08	2.56	Yes	No	HQ less than one, detected
Lead	-- - --	67 / 67	17.3	CJCA-SB60-4-6-09C	11.0	24 / 67	1.57	8.34	0.76	8.49	Yes	No	Within background range
Zinc	3.70 - 4.80	39 / 67	49.0	CJCA-SB09-2-4-09C	46.0	1 / 67	1.07	5.29	0.11	6.59	Yes	No	Low magnitude and frequency of exceedance

NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
MG/KG - Milligrams per kilogram  
HQ - Hazard Quotient  
NSV - No Screening Value  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-3  
ERS Groundwater Screen for UXO-20  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Inorganics (UG/L)																
Antimony	20.0 - 100	0 / 37	--	--	NSV	-- / --	NSV	11.1	NSV	3.28	--	160	TCEQ, 2006 <sup>3</sup>	0.625	No	Supplemental HQ less than one
Arsenic	20.0 - 20.0	12 / 37	9.40	CJCA-TW27-09C	36.0	0 / 37	0.26	8.05	0.22	5.77	Yes	--	--	--	No	Within range of background
Copper	20.0 - 100	12 / 37	10.4	CJCA-TW17-09C	3.10	10 / 37	3.35	9.58	3.09	2.76	Yes	--	--	--	No	Within range of background
Lead	20.0 - 20.0	12 / 37	19.1	CJCA-TW01-09C	8.10	4 / 37	2.36	8.95	1.10	2.80	Yes	--	--	--	No	Within range of background
Zinc	250 - 250	36 / 37	160	CJCA-TW17-09C	81.0	4 / 37	1.98	36.0	0.44	42.1	Yes	--	--	--	No	Within range of background
Dissolved Metals (UG/L)																
Antimony, Dissolved	20.0 - 20.0	0 / 12	--	--	NSV	-- / --	NSV	10.0	NSV	3.28	--	160	TCEQ, 2006 <sup>3</sup>	0.125	No	Supplemental HQ less than one
Arsenic, Dissolved	20.0 - 20.0	1 / 12	4.90	CJCA-TW36-09C	36.0	0 / 12	0.14	9.58	0.27	5.77	No	--	--	--	No	Consistent with background
Copper, Dissolved	20.0 - 20.0	2 / 12	3.60	CJCA-TW28-09C	3.10	2 / 12	1.16	8.89	2.87	2.76	Yes	--	--	--	No	Within range of background
Lead, Dissolved	20.0 - 20.0	2 / 12	2.00	CJCA-TW01-09C	8.10	0 / 12	0.25	8.67	1.07	2.80	No	--	--	--	No	Within range of background
Zinc, Dissolved	50.0 - 50.0	9 / 12	82.3	CJCA-TW17-09C	81.0	1 / 12	1.0	31.9	0.4	42.1	Yes	--	--	--	No	Within range of background

NOTES  
1 - Marine screening values  
2 - Count of detected samples exceeding or equaling Screening Value  
3 - Based on freshwater  
HQ - Hazard Quotient  
NSV - No Screening Value  
UG/L - Micrograms per liter  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-4  
ERS Surface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	4.20 - 9.10	0 / 12	--	--	10.0	-- / --	0.91	2.98	0.30	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromo-3-chloropropane	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dibromoethane	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	4.20 - 9.10	0 / 12	--	--	10.0	-- / --	0.91	2.98	0.30	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	4.20 - 9.10	0 / 12	--	--	400	-- / --	0.023	2.98	0.007	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	4.20 - 9.10	0 / 12	--	--	700,000	-- / --	1.30E-05	2.98	4.250E-06	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	4.20 - 9.10	0 / 12	--	--	10.0	-- / --	0.91	2.98	0.30	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	4.20 - 9.10	0 / 12	--	--	10.0	-- / --	0.91	2.98	0.30	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	8.50 - 12.0	7 / 12	40.0	IR15-SS08-00-01-09C	NSV	-- / --	NSV	11.7	NSV	--	--	89,600	Buchman, 2008	4.46E-04	No	Supplemental HQ less than one, common Lab contaminant
2-Hexanone	8.50 - 18.0	0 / 12	--	--	NSV	-- / --	NSV	6.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	8.50 - 18.0	0 / 12	--	--	NSV	-- / --	NSV	6.00	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	11.0 - 11.0	12 / 13	1,700	IR15-SS08-00-01-09C	NSV	-- / --	NSV	285	NSV	--	--	2500	Buchman, 2008	6.80E-01	No	Supplemental HQ less than one, common Lab contaminant
Benzene	4.20 - 9.10	0 / 12	--	--	50.0	-- / --	0.18	2.98	0.06	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Bromomethane	5.40 - 12.0	0 / 10	--	--	NSV	-- / --	NSV	4.30	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon disulfide	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	4.20 - 9.10	0 / 12	--	--	1,000,000	-- / --	9.10E-06	2.98	2.975E-06	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	4.20 - 9.10	0 / 12	--	--	50.0	-- / --	0.18	2.98	0.06	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	5.40 - 14.0	0 / 12	--	--	100	-- / --	0.14	4.63	0.046	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	4.20 - 9.10	1 / 12	5.20	IR15-SS01-00-01-09C	1.00	1 / 12	5.20	3.17	3.17	--	--	--	--	--	No	Common lab contaminant, few VOCs detected
Chloromethane	5.40 - 14.0	0 / 12	--	--	NSV	-- / --	NSV	4.63	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,2-Dichloroethene	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Cyclohexane	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	4.20 - 9.10	0 / 12	--	--	50.0	-- / --	0.18	2.98	0.06	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	4.20 - 9.10	5 / 13	2,100	IR15-SS08-00-01-09C	NSV	-- / --	NSV	167	NSV	--	--	--	--	--	No	Uncertainty, No screening value
Methylcyclohexane	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	5.40 - 14.0	0 / 12	--	--	2,000	-- / --	0.0070	4.63	0.002	--	--	--	--	--	No	HQ less than one, not detected
Methyl-tert-butyl ether (MTBE)	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
Tetrachloroethene	4.20 - 9.10	0 / 12	--	--	10.0	-- / --	0.91	2.98	0.30	--	--	--	--	--	No	HQ less than one, not detected
Toluene	4.20 - 9.10	1 / 12	10.0	IR15-SS08-00-01-09C	50.0	0 / 12	0.20	3.52	0.07	--	--	--	--	--	No	HQ less than one, detected
trans-1,2-Dichloroethene	4.20 - 9.10	0 / 12	--	--	100	-- / --	0.091	2.98	0.03	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Trichloroethene	4.20 - 9.10	0 / 12	--	--	1.00	-- / --	9.10	2.98	2.98	--	--	--	--	--	No	Not detected
Trichlorofluoromethane (Freon-11)	4.20 - 9.10	0 / 12	--	--	NSV	-- / --	NSV	2.98	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	5.40 - 14.0	0 / 12	--	--	10.0	-- / --	1.40	4.63	0.46	--	--	--	--	--	No	Not detected
Xylene, total	4.20 - 9.10	0 / 12	--	--	50.0	-- / --	0.18	2.98	0.06	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	170 - 400	0 / 15	--	--	60,000	-- / --	0.0067	125	0.002	--	--	--	--	--	No	HQ less than one, not detected
2,2'-Oxybis(1-chloropropane)	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	170 - 400	0 / 15	--	--	4,000	-- / --	0.10	125	0.031	--	--	--	--	--	No	HQ less than one, not detected



Table F-4  
ERS Surface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
2,4,6-Trichlorophenol	360 - 400	0 / 5	--	--	10,000	-- / --	0.040	189	0.019	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	170 - 400	0 / 15	--	--	3.00	-- / --	133	125	42	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	170 - 1,000	0 / 15	--	--	20,000	-- / --	0.050	220	0.011	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	170 - 400	0 / 15	--	--	1,000	-- / --	0.40	125	0.12	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	170 - 400	0 / 15	--	--	10.0	-- / --	40.0	125	12	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	170 - 400	0 / 15	--	--	500	-- / --	0.80	125	0.25	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
3- and 4-Methylphenol	730 - 800	0 / 5	--	--	NSV	-- / --	NSV	384	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	170 - 1,000	0 / 15	--	--	NSV	-- / --	NSV	220	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	170 - 1,000	0 / 15	--	--	NSV	-- / --	NSV	220	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	170 - 400	0 / 15	--	--	20,000	-- / --	0.020	125	0.006	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	170 - 210	0 / 10	--	--	500	-- / --	0.42	92.5	0.19	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	170 - 1,000	0 / 15	--	--	7,000	-- / --	0.14	220	0.031	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	170 - 400	0 / 15	--	--	0.050	-- / --	8,000	125	2493	--	--	--	--	--	No	Not detected
Benzaldehyde	170 - 1,000	0 / 15	--	--	NSV	-- / --	NSV	220	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	35.0 - 400	0 / 15	--	--	1,100	-- / --	0.36	75.4	0.069	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	35.0 - 400	0 / 15	--	--	1,100	-- / --	0.36	75.4	0.069	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	35.0 - 400	0 / 15	--	--	1,100	-- / --	0.36	75.4	0.069	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	170 - 400	1 / 15	95.0	IR15-SS03-00-01-09C	1,100	0 / 15	0.086	125	0.11	--	--	--	--	--	No	HQ less than one, detected
Benzo(k)fluoranthene	170 - 400	0 / 15	--	--	1,100	-- / --	0.36	125	0.11	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	180 - 400	3 / 15	180	IR15-SS01-00-01-09C	100	2 / 15	1.80	132	1.32	--	--	--	--	--	No	Low frequency and magnitude of exceedance
Butylbenzylphthalate	170 - 400	1 / 15	190	IR15-SS01-00-01-09C	100	1 / 15	1.90	131	1.31	--	--	--	--	--	No	Low frequency and magnitude of exceedance
Caprolactam	170 - 1,000	0 / 14	--	--	NSV	-- / --	NSV	230	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	24.0 - 380	0 / 15	--	--	NSV	-- / --	NSV	112	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	170 - 380	2 / 15	22.0	SWMU46-SM01-0-1	1,100	0 / 15	0.020	101	0.092	--	--	--	--	--	No	HQ less than one, detected
Dibenz(a,h)anthracene	35.0 - 400	1 / 15	64.0	IR15-SS03-00-01-09C	1,100	0 / 15	0.058	78.4	0.071	--	--	--	--	--	No	HQ less than one, detected
Dibenzofuran	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	170 - 400	0 / 15	--	--	100,000	-- / --	0.0040	125	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	170 - 400	0 / 15	--	--	200,000	-- / --	0.0020	125	0.001	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	170 - 370	6 / 15	150	IR15-SS10-00-01-09C	200,000	0 / 15	7.50E-04	99.9	4.997E-04	--	--	--	--	--	No	HQ less than one, detected
Di-n-octylphthalate	170 - 400	0 / 15	--	--	100	-- / --	4.00	125	1.25	--	--	--	--	--	No	Not detected
Fluoranthene	24.0 - 380	0 / 15	--	--	1,100	-- / --	0.35	112	0.10	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	170 - 400	0 / 15	--	--	2.50	-- / --	160	125	50	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	170 - 400	0 / 15	--	--	NSV	-- / --	NSV	125	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorocyclopentadiene	170 - 1,000	0 / 15	--	--	10,000	-- / --	0.10	220	0.022	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	170 - 400	0 / 15	--	--	100	-- / --	4.00	125	1.25	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	35.0 - 400	1 / 15	52.0	IR15-SS03-00-01-09C	1,100	0 / 15	0.047	77.6	0.071	--	--	--	--	--	No	HQ less than one, detected



Table F-4  
ERS Surface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Isophorone	35.0 - 400	0 / 15	--	--	NSV	-- / --	NSV	75.4	NSV	--	--	--	--	--	No	No screening value, not detected
Naphthalene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	35.0 - 400	0 / 15	--	--	NSV	-- / --	NSV	75.4	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	170 - 400	0 / 15	--	--	20,000	-- / --	0.020	125	0.006	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	170 - 400	0 / 15	--	--	40,000	-- / --	0.010	125	0.003	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	170 - 1,000	0 / 15	--	--	2,100	-- / --	0.48	220	0.10	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	170 - 400	0 / 15	--	--	29,000	-- / --	0.014	125	0.004	--	--	--	--	--	No	HQ less than one, not detected
Phenol	170 - 400	0 / 15	--	--	50.0	-- / --	8.00	125	2.49	--	--	--	--	--	No	Not detected
Pyrene	28.0 - 380	0 / 15	--	--	1,100	-- / --	0.35	112	0.10	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	1.70 - 2.10	4 / 15	7.50	IR15-SS01-00-01-09C	21.0	0 / 15	0.36	1.70	0.081	--	--	--	--	--	No	HQ less than one, detected
4,4'-DDE	1.80 - 2.00	10 / 15	25.0	IR15-SS01-00-01-09C	21.0	3 / 15	1.19	7.75	0.37	--	--	--	--	--	No	Low magnitude of exceedance
4,4'-DDT	1.80 - 2.00	9 / 15	24.0	IR15-SS10-00-01-09C	21.0	2 / 15	1.14	6.39	0.30	--	--	--	--	--	No	Low magnitude of exceedance
Aldrin	1.70 - 2.10	0 / 15	--	--	2.50	-- / --	0.84	0.94	0.38	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	1.70 - 2.10	0 / 15	--	--	2.50	-- / --	0.84	0.94	0.38	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	1.70 - 2.10	3 / 15	7.40	IR15-SS01-00-01-09C	100	0 / 15	0.074	1.39	0.014	--	--	--	--	--	No	HQ less than one, detected
Aroclor-1016	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
Aroclor-1221	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
Aroclor-1232	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
Aroclor-1242	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
Aroclor-1248	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
Aroclor-1254	17.0 - 21.0	1 / 15	360	IR15-SS01-00-01-09C	20.0	1 / 15	18.0	32.7	1.63	--	--	--	--	--	Yes	Elevated HQ and undefined contamination
Aroclor-1260	17.0 - 21.0	0 / 15	--	--	20.0	-- / --	1.05	9.30	0.47	--	--	--	--	--	No	Not detected
beta-BHC	1.70 - 2.10	0 / 15	--	--	1.00	-- / --	2.10	0.94	0.94	--	--	--	--	--	No	Not detected
delta-BHC	1.70 - 2.10	0 / 15	--	--	100	-- / --	0.021	0.94	0.009	--	--	--	--	--	No	HQ less than one, not detected
Dieldrin	1.70 - 2.10	2 / 15	1.70	IR15-SS09-00-01-09C	4.90	0 / 15	0.35	0.99	0.20	--	--	--	--	--	No	HQ less than one, detected
Endosulfan I	1.70 - 2.10	0 / 15	--	--	100	-- / --	0.021	0.94	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.70 - 2.10	2 / 15	1.20	SWMU46-SM08-0-1	100	0 / 15	0.012	0.96	0.01	--	--	--	--	--	No	HQ less than one, detected
Endosulfan sulfate	1.70 - 2.10	4 / 15	38.0	SWMU46-SM03-0-1	100	0 / 15	0.38	7.68	0.077	--	--	--	--	--	No	HQ less than one, detected
Endrin	1.70 - 2.10	1 / 15	1.70	SWMU46-SM01-0-1	1.00	1 / 15	1.70	0.99	0.99	--	--	--	--	--	No	Low frequency and magnitude of exceedance
Endrin aldehyde	1.70 - 2.10	0 / 15	--	--	100	-- / --	0.021	0.94	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.70 - 2.10	4 / 15	18.0	SWMU46-SM05-0-1	100	0 / 15	0.18	3.93	0.039	--	--	--	--	--	No	HQ less than one, detected
gamma-BHC (Lindane)	1.70 - 2.10	0 / 15	--	--	0.050	-- / --	42.0	0.94	19	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.70 - 2.10	3 / 15	8.60	IR15-SS01-00-01-09C	100	0 / 15	0.086	1.42	0.014	--	--	--	--	--	No	HQ less than one, detected
Heptachlor	1.70 - 2.10	0 / 15	--	--	100	-- / --	0.021	0.94	0.009	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.70 - 2.10	0 / 15	--	--	100	-- / --	0.021	0.94	0.009	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.70 - 7.80	1 / 15	4.60	SWMU46-SM01-0-1	100	0 / 15	0.046	1.94	0.019	--	--	--	--	--	No	HQ less than one, detected
Toxaphene	35.0 - 100	0 / 15	--	--	100	-- / --	1.00	28.3	0.28	--	--	--	--	--	No	Not detected
Inorganics (MG/KG)																
Aluminum	-- - --	10 / 10	12,500	IR15-SS03-00-01-09C	50.0	10 / 10	250	4,866	97	5,487	Yes	--	--	--	No	Within background range
Antimony	1.50 - 1.60	4 / 10	0.64	IR15-SS01-00-01-09C	0.27	4 / 10	2.37	0.62	2.29	0.447	Yes	--	--	--	No	Within background range
Arsenic	-- - --	16 / 16	4.70	IR15-SS03-00-01-09C	18.0	0 / 16	0.26	1.42	0.079	0.626	Yes	--	--	--	No	HQ less than one, detected
Barium	-- - --	16 / 16	34.3	IR15-SS01-00-01-09C	330	0 / 16	0.10	11.1	0.034	14.5	Yes	--	--	--	No	HQ less than one, detected
Beryllium	0.15 - 0.18	5 / 10	0.14	IR15-SS03-00-01-09C	21.0	0 / 10	0.0067	0.082	0.004	0.103	Yes	--	--	--	No	Within background range
Cadmium	0.011 - 0.49	9 / 16	0.61	IR15-SS01-00-01-09C	0.36	1 / 16	1.69	0.12	0.33	0.033	Yes	--	--	--	No	Low frequency and magnitude of exceedance
Calcium <sup>2</sup>	-- - --	10 / 10	36,500	IR15-SS01-00-01-09C	NSV	-- / --	NSV	7,241	NSV	6360	Yes	--	--	--	No	Macronutrient
Chromium	-- - --	16 / 16	17.2	IR15-SS03-00-01-09C	26.0	0 / 16	0.66	5.61	0.22	6.05	Yes	--	--	--	No	HQ less than one, detected
Cobalt	0.38 - 0.45	8 / 10	0.57	IR15-SS01-00-01-09C	13.0	0 / 10	0.044	0.27	0.021	0.294	Yes	--	--	--	No	HQ less than one, detected
Copper	-- - --	10 / 10	42.1	IR15-SS01-00-01-09C	28.0	1 / 10	1.50	7.61	0.27	4.83	Yes	--	--	--	No	Low frequency and magnitude of exceedance
Iron	-- - --	10 / 10	10,200	IR15-SS03-00-01-09C	200	10 / 10	51.0	3,676	18	3245	Yes	--	--	--	No	Within background range
Lead	-- - --	16 / 16	70.3	IR15-SS01-00-01-09C	11.0	7 / 16	6.39	14.3	1.30	12.3	Yes	50	Region 4 (EPA, 2001)	1.4	No	Low frequency (1/16) and magnitude of exceedance based on supplemental screening value



Table F-4  
ERS Surface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Magnesium <sup>2</sup>	-- - --	10 / 10	796	IR15-SS03-00-01-09C	NSV	-- / --	NSV	242	NSV	238	Yes	--	--	--	No	Macronutrient
Manganese	-- - --	10 / 10	22.2	IR15-SS01-00-01-09C	220	0 / 10	0.10	10.0	0.045	13.7	Yes	--	--	--	No	Within background range
Mercury	0.015 - 0.039	7 / 16	0.51	IR15-SS01-00-01-09C	0.10	1 / 16	5.10	0.053	0.53	0.081	Yes	--	--	--	Yes	Elevated HQ and undefined contamination
Nickel	-- - --	10 / 10	2.70	IR15-SS01-00-01-09C	38.0	0 / 10	0.071	1.31	0.034	1.21	Yes	--	--	--	No	HQ less than one, detected
Potassium <sup>2</sup>	76.3 - 78.8	7 / 10	497	IR15-SS03-00-01-09C	NSV	-- / --	NSV	203	NSV	116	Yes	--	--	--	No	Macronutrient
Selenium	1.50 - 1.80	7 / 16	0.56	SWMU46-SM08-0-1	0.52	1 / 16	1.08	0.61	1.18	0.563	No	--	--	--	No	Consistent with background
Silver	0.046 - 1.80	4 / 16	0.17	IR15-SS05-00-01-09C	4.20	0 / 16	0.040	0.48	0.11	0.14	Yes	--	--	--	No	Within background range
Sodium <sup>2</sup>	188 - 202	5 / 10	68.7	IR15-SS03-00-01-09C	NSV	-- / --	NSV	61.1	NSV	80.9	No	--	--	--	No	Macronutrient
Thallium	2.30 - 2.70	0 / 10	--	--	1.00	-- / --	2.70	1.20	1.20	0.36	--	--	--	--	No	Not detected
Vanadium	-- - --	10 / 10	22.3	IR15-SS03-00-01-09C	7.80	4 / 10	2.86	8.98	1.15	8.9	Yes	--	--	--	No	Within background range
Zinc	3.80 - 39.0	7 / 10	170	IR15-SS01-00-01-09C	46.0	1 / 10	3.70	27.6	0.60	10.8	Yes	--	--	--	No	Low frequency (1/10) and magnitude of exceedance. Mean HQ less than one. Only slightly greater than background range.

NOTES

1 - Count of detected samples exceeding or equaling Screening Value

2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)

HQ - Hazard Quotient

NSV - No Screening Value

MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Generated by: Sara Kent

Checked by: Kelly Taylor



Table F-5  
ERS Subsurface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethane	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.60 - 2.40	4 / 9	2.50	IR15-SB07-2-4-09C	10.0	0 / 9	0.25	1.54	0.15	--	--	--	--	--	No	HQ less than one, detected
1,2-Dibromo-3-chloropropane	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dibromoethane	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.60 - 2.40	0 / 8	--	--	10.0	-- / --	0.24	0.93	0.093	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.60 - 2.40	0 / 8	--	--	400	-- / --	0.0060	0.93	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.60 - 2.40	0 / 8	--	--	700,000	-- / --	3.43E-06	0.93	0.000	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.60 - 2.40	3 / 9	1.60	IR15-SB07-2-4-09C	10.0	0 / 9	0.16	1.08	0.108	--	--	--	--	--	No	HQ less than one, detected
1,4-Dichlorobenzene	1.60 - 2.40	2 / 9	1.60	IR15-SB07-2-4-09C	10.0	0 / 9	0.16	1.04	0.104	--	--	--	--	--	No	HQ less than one, detected
2-Butanone	3.10 - 4.80	3 / 9	21.0	IR15-SB07-2-4-09C	NSV	-- / --	NSV	5.94	NSV	--	--	89,600	Buchman, 2008	2.34E-04	No	Supplemental HQ less than one, common Lab contaminant
2-Hexanone	3.10 - 4.80	2 / 9	4.10	IR15-SB07-2-4-09C	NSV	-- / --	NSV	1.95	NSV	--	--	12,600	Buchman, 2008	3.25E-04	No	Supplemental HQ less than one
4-Methyl-2-pentanone	3.10 - 4.80	1 / 9	1.70	IR15-SB09-2-7-09C	NSV	-- / --	NSV	1.85	NSV	--	--	443,000	Buchman, 2008	3.84E-06	No	Supplemental HQ less than one
Acetone	3.40 - 3.40	9 / 10	180	IR15-SB09-2-7-09C	NSV	-- / --	NSV	49.3	NSV	--	--	2500	Buchman, 2008	7.20E-02	No	Supplemental HQ less than one, common Lab contaminant
Benzene	1.60 - 2.40	2 / 9	0.97	IR15-SB04-2-7-09C	50.0	0 / 9	0.019	0.88	0.018	--	--	255	Buchman, 2008	3.80E-03	No	Supplemental HQ less than one
Bromodichloromethane	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Bromomethane	3.20 - 4.80	0 / 7	--	--	NSV	-- / --	NSV	1.91	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon disulfide	1.60 - 2.10	1 / 8	1.40	IR15-SB02-2-7-09C	NSV	-- / --	NSV	0.96	NSV	--	--	94.1	Buchman, 2008	1.49E-02	No	Supplemental HQ less than one
Carbon tetrachloride	1.60 - 2.40	0 / 8	--	--	1,000,000	-- / --	2.40E-06	0.93	9.313E-07	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.60 - 2.40	1 / 9	2.60	IR15-SB09-2-7-09C	50.0	0 / 9	0.052	1.12	0.022	--	--	--	--	--	No	HQ less than one, detected
Chloroethane	3.20 - 4.80	0 / 7	--	--	100	-- / --	0.048	1.91	0.019	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	1.60 - 2.40	0 / 8	--	--	1.00	-- / --	2.40	0.93	0.93	--	--	--	--	--	No	HQ less than one, not detected
Chloromethane	3.10 - 4.80	0 / 8	--	--	NSV	-- / --	NSV	1.87	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,2-Dichloroethene	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Cyclohexane	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	1.60 - 2.40	0 / 8	--	--	50.0	-- / --	0.048	0.93	0.019	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.60 - 4.20	0 / 8	--	--	NSV	-- / --	NSV	1.21	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	1.60 - 2.10	2 / 8	7.80	IR15-SB05-2-7-09C	NSV	-- / --	NSV	2.08	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methylcyclohexane	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	3.10 - 3.60	4 / 8	8.90	IR15-SB05-2-7-09C	2,000	0 / 8	0.0045	3.11	0.002	--	--	--	--	--	No	HQ less than one, detected
Methyl-tert-butyl ether (MTBE)	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.60 - 3.90	2 / 9	2.90	IR15-SB07-2-4-09C	100	0 / 9	0.029	1.52	0.015	--	--	--	--	--	No	HQ less than one, detected
Tetrachloroethene	1.60 - 2.40	1 / 9	1.50	IR15-SB09-2-7-09C	10.0	0 / 9	0.15	0.99	0.099	--	--	--	--	--	No	HQ less than one, detected
Toluene	1.60 - 2.40	3 / 9	2.90	IR15-SB07-2-4-09C	50.0	0 / 9	0.058	1.29	0.026	--	--	--	--	--	No	HQ less than one, detected
trans-1,2-Dichloroethene	1.60 - 2.40	0 / 8	--	--	100	-- / --	0.024	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Trichloroethene	1.60 - 2.40	0 / 8	--	--	1.00	-- / --	2.40	0.93	0.93	--	--	--	--	--	No	Not detected
Trichlorofluoromethane(Freon-11)	1.60 - 2.40	0 / 8	--	--	NSV	-- / --	NSV	0.93	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	3.10 - 4.80	0 / 8	--	--	10.0	-- / --	0.48	1.87	0.19	--	--	--	--	--	No	HQ less than one, not detected
Xylene, total	1.60 - 8.30	0 / 8	--	--	50.0	-- / --	0.17	1.78	0.036	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	180 - 210	0 / 10	--	--	60,000	-- / --	0.0035	96.5	0.002	--	--	--	--	--	No	HQ less than one, not detected
2,2'-Oxybis(1-chloropropane)	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	180 - 210	0 / 10	--	--	4,000	-- / --	0.053	96.5	0.024	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	180 - 210	0 / 10	--	--	3.00	-- / --	70.0	96.5	32	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	180 - 210	0 / 10	--	--	20,000	-- / --	0.011	96.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	180 - 210	0 / 10	--	--	1,000	-- / --	0.21	96.5	0.097	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	180 - 210	0 / 10	--	--	10.0	-- / --	21.0	96.5	9.65	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	180 - 210	0 / 10	--	--	500	-- / --	0.42	96.5	0.19	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-5  
ERS Subsurface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PAVSI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
2-Nitrophenol	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	180 - 210	0 / 10	--	--	20,000	-- / --	0.011	96.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	180 - 210	0 / 10	--	--	500	-- / --	0.42	96.5	0.19	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	180 - 210	0 / 10	--	--	7,000	-- / --	0.030	96.5	0.014	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	180 - 210	0 / 10	--	--	0.050	-- / --	4,200	96.5	1930	--	--	--	--	--	No	Not detected
Benzaldehyde	190 - 190	0 / 1	--	--	NSV	-- / --	NSV	95.0	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	36.0 - 42.0	0 / 10	--	--	1,100	-- / --	0.038	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	36.0 - 42.0	0 / 10	--	--	1,100	-- / --	0.038	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	36.0 - 42.0	0 / 10	--	--	1,100	-- / --	0.038	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	180 - 210	0 / 10	--	--	1,100	-- / --	0.19	96.5	0.088	--	--	--	--	--	No	HQ less than one, not detected
Benzo(k)fluoranthene	180 - 210	0 / 10	--	--	1,100	-- / --	0.19	96.5	0.088	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	180 - 360	3 / 10	37.0	IR15-SB01-4-6-09C	100	0 / 10	0.37	100	1	--	--	--	--	--	No	HQ less than one, detected
Butylbenzylphthalate	180 - 210	0 / 10	--	--	100	-- / --	2.10	96.5	0.97	--	--	--	--	--	No	Not detected
Caprolactam	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	180 - 210	0 / 10	--	--	1,100	-- / --	0.19	96.5	0.088	--	--	--	--	--	No	HQ less than one, not detected
Dibenz(a,h)anthracene	36.0 - 42.0	0 / 10	--	--	1,100	-- / --	0.038	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Dibenzofuran	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	180 - 210	0 / 10	--	--	100,000	-- / --	0.0021	96.5	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	180 - 210	0 / 10	--	--	200,000	-- / --	0.0011	96.5	4.825E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	180 - 210	0 / 10	--	--	200,000	-- / --	0.0011	96.5	4.825E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-octylphthalate	180 - 210	0 / 10	--	--	100	-- / --	2.10	96.5	0.97	--	--	--	--	--	No	Not detected
Fluoranthene	180 - 210	0 / 10	--	--	1,100	-- / --	0.19	96.5	0.088	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	180 - 210	0 / 10	--	--	2.50	-- / --	84.0	96.5	39	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	180 - 210	0 / 10	--	--	NSV	-- / --	NSV	96.5	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorocyclopentadiene	180 - 210	0 / 10	--	--	10,000	-- / --	0.021	96.5	0.010	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	180 - 210	0 / 10	--	--	100	-- / --	2.10	96.5	0.97	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	36.0 - 42.0	0 / 10	--	--	1,100	-- / --	0.038	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Isophorone	36.0 - 42.0	0 / 10	--	--	NSV	-- / --	NSV	19.2	NSV	--	--	--	--	--	No	No screening value, not detected
Naphthalene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	36.0 - 42.0	0 / 10	--	--	NSV	-- / --	NSV	19.2	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	180 - 210	0 / 10	--	--	20,000	-- / --	0.011	96.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	180 - 210	0 / 10	--	--	40,000	-- / --	0.0053	96.5	0.002	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	180 - 210	0 / 10	--	--	2,100	-- / --	0.10	96.5	0.046	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	180 - 210	0 / 10	--	--	29,000	-- / --	0.0072	96.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Phenol	180 - 210	0 / 10	--	--	50.0	-- / --	4.20	96.5	1.93	--	--	--	--	--	No	Not detected
Pyrene	180 - 210	0 / 10	--	--	1,100	-- / --	0.19	96.5	0.088	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	1.80 - 2.10	5 / 10	46.0	IR15-SB10-2-4-09C	21.0	1 / 10	2.19	6.56	0.31	--	--	--	--	--	No	Low frequency and magnitude of exceedance. Mean HQ less than one.
4,4'-DDE	1.80 - 1.90	7 / 10	95.0	IR15-SB10-2-4-09C	21.0	1 / 10	4.52	11.8	0.56	--	--	--	--	--	Yes	HQ above 1 and undefined
4,4'-DDT	1.80 - 2.10	5 / 10	180	IR15-SB10-2-4-09C	21.0	2 / 10	8.57	21.6	1.03	--	--	--	--	--	Yes	HQ above 1 and undefined
Aldrin	1.80 - 2.10	0 / 10	--	--	2.50	-- / --	0.84	0.97	0.39	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	1.80 - 2.10	0 / 10	--	--	2.50	-- / --	0.84	0.97	0.39	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	1.80 - 2.10	2 / 10	9.90	IR15-SB10-2-4-09C	100	0 / 10	0.099	2.14	0.02	--	--	--	--	--	No	HQ less than one, detected
Aroclor-1016	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
Aroclor-1221	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
Aroclor-1232	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
Aroclor-1242	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
Aroclor-1248	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
Aroclor-1254	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected



Table F-5  
ERS Subsurface Soil Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PAVSI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Aroclor-1260	18.0 - 21.0	0 / 10	--	--	20.0	-- / --	1.05	9.65	0.48	--	--	--	--	--	No	Not detected
beta-BHC	1.80 - 2.10	0 / 10	--	--	1.00	-- / --	2.10	0.97	0.97	--	--	--	--	--	No	Not detected
delta-BHC	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Dieldrin	1.80 - 2.10	1 / 10	2.30	IR15-SB05-2-7-09C	4.90	0 / 10	0.47	1.10	0.22	--	--	--	--	--	No	HQ less than one, detected
Endosulfan I	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan sulfate	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Endrin	1.80 - 2.10	0 / 10	--	--	1.00	-- / --	2.10	0.97	0.97	--	--	--	--	--	No	Not detected
Endrin aldehyde	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
gamma-BHC (Lindane)	1.80 - 2.10	0 / 10	--	--	0.050	-- / --	42.0	0.97	19	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.80 - 2.10	2 / 10	7.40	IR15-SB10-2-4-09C	100	0 / 10	0.074	1.84	0.02	--	--	--	--	--	No	HQ less than one, detected
Heptachlor	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.80 - 2.10	0 / 10	--	--	100	-- / --	0.021	0.97	0.01	--	--	--	--	--	No	HQ less than one, not detected
Toxaphene	36.0 - 42.0	0 / 10	--	--	100	-- / --	0.42	19.2	0.19	--	--	--	--	--	No	HQ less than one, not detected
Inorganics (MG/KG)																
Aluminum	-- - --	10 / 10	6,070	IR15-SB02-2-7-09C	50.0	10 / 10	121	3,523	70	10,369	No	--	--	--	No	Consistent with background
Antimony	1.50 - 8.60	2 / 10	0.82	IR15-SB01-4-6-09C	0.27	1 / 10	3.04	1.10	4.09	0.36	Yes	--	--	--	Yes	HQ above 1 and well above background range
Arsenic	1.60 - 1.60	9 / 10	16.6	IR15-SB09-2-7-09C	18.0	0 / 10	0.92	2.81	0.16	2.12	Yes	--	--	--	No	HQ less than one, detected
Barium	4.10 - 21.5	8 / 10	32.3	IR15-SB01-4-6-09C	330	0 / 10	0.098	10.7	0.032	16.6	Yes	--	--	--	No	HQ less than one, detected
Beryllium	0.15 - 0.18	4 / 10	0.071	IR15-SB09-2-7-09C	21.0	0 / 10	0.0034	0.070	0.003	0.165	No	--	--	--	No	Consistent with background
Cadmium	0.46 - 0.54	3 / 10	0.82	IR15-SB09-2-7-09C	0.36	2 / 10	2.28	0.31	0.86	0.023	Yes	--	--	--	No	Low magnitude of exceedance, mean HQ less than one
Calcium <sup>2</sup>	76.9 - 82.1	8 / 10	20,000	IR15-SB01-4-6-09C	NSV	-- / --	NSV	2,490	NSV	441	Yes	--	--	--	No	Macronutrient
Chromium	-- - --	10 / 10	52.4	IR15-SB09-2-7-09C	26.0	1 / 10	2.02	10.0	0.38	14.5	Yes	--	--	--	No	Low frequency and magnitude of exceedance, mean HQ less than one
Cobalt	0.41 - 0.41	9 / 10	9.30	IR15-SB09-2-7-09C	13.0	0 / 10	0.72	1.16	0.089	0.822	Yes	--	--	--	No	Mean HQ less than one
Copper	1.60 - 1.60	9 / 10	31.7	IR15-SB04-2-7-09C	28.0	1 / 10	1.13	8.31	0.30	2.56	Yes	--	--	--	No	Low frequency and magnitude of exceedance, mean HQ less than one
Iron	-- - --	10 / 10	179,000	IR15-SB09-2-7-09C	200	9 / 10	895	20,233	101	5,439	Yes	--	--	--	Yes	HQ above 1 and well above background range
Lead	-- - --	10 / 10	483	IR15-SB01-4-6-09C	11.0	4 / 10	43.9	69.8	6.35	8.49	Yes	50	Region 4 (EPA, 2001)	9.66	Yes	HQ above 1 and well above background range
Magnesium <sup>2</sup>	-- - --	10 / 10	219	IR15-SB01-4-6-09C	NSV	-- / --	NSV	138	NSV	363	No	--	--	--	No	Macronutrient
Manganese	-- - --	10 / 10	626	IR15-SB09-2-7-09C	220	1 / 10	2.85	76.1	0.35	9.25	Yes	--	--	--	No	Low frequency and magnitude of exceedance, mean HQ less than one
Mercury	0.033 - 0.037	6 / 10	0.14	IR15-SB01-4-6-09C	0.10	1 / 10	1.40	0.036	0.36	0.071	Yes	--	--	--	No	Within background range
Nickel	0.79 - 0.82	8 / 10	24.4	IR15-SB09-2-7-09C	38.0	0 / 10	0.64	3.57	0.094	2.27	Yes	--	--	--	No	HQ less than one, detected
Potassium <sup>2</sup>	-- - --	10 / 10	236	IR15-SB09-2-7-09C	NSV	-- / --	NSV	126	NSV	361	No	--	--	--	No	Macronutrient
Selenium	1.50 - 8.60	0 / 10	--	--	0.52	-- / --	16.5	1.16	2.23	0.505	--	--	--	--	No	Not detected
Silver	1.50 - 8.60	0 / 10	--	--	4.20	-- / --	2.05	1.16	0.28	0.129	--	--	--	--	No	Not detected
Sodium <sup>2</sup>	194 - 1,080	6 / 10	15.0	IR15-SB04-2-7-09C	NSV	-- / --	NSV	89.0	NSV	68.3	No	--	--	--	No	Macronutrient
Thallium	2.30 - 2.70	1 / 10	1.90	IR15-SB09-2-7-09C	1.00	1 / 10	1.90	1.30	1.30	0.38	Yes	--	--	--	No	Low frequency and magnitude of exceedance
Vanadium	4.10 - 21.5	8 / 10	10.4	IR15-SB02-2-7-09C	7.80	3 / 10	1.33	6.67	0.86	17.2	No	--	--	--	No	Consistent with background
Zinc	3.90 - 8.00	6 / 10	345	IR15-SB01-4-6-09C	46.0	2 / 10	7.50	51.3	1.12	6.59	Yes	--	--	--	Yes	HQ above 1 and well above background range

NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
HQ - Hazard Quotient  
NSV - No Screening Value  
MG/KG - Milligrams per kilogram  
UG/KG - Micrograms per kilogram  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-6

ERS Groundwater Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Volatile Organic Compounds (UG/L)																
1,1,1-Trichloroethane	1.00 - 1.00	0 / 4	--	--	312	-- / --	0.0032	0.50	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.00 - 2.40	0 / 4	--	--	90.2	-- / --	0.027	0.68	0.007	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethene	1.00 - 1.00	0 / 4	--	--	2,240	-- / --	4.46E-04	0.50	2.232E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.00 - 1.00	0 / 4	--	--	4.50	-- / --	0.22	0.50	0.11	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromoethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.00 - 1.00	0 / 4	--	--	19.7	-- / --	0.051	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.00 - 1.00	0 / 4	--	--	1,130	-- / --	8.85E-04	0.50	4.425E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.00 - 1.00	0 / 4	--	--	2,400	-- / --	4.17E-04	0.50	2.083E-04	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.00 - 1.00	0 / 4	--	--	28.5	-- / --	0.035	0.50	0.018	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	1.00 - 1.00	0 / 4	--	--	19.9	-- / --	0.050	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	5.00 - 5.00	0 / 4	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
2-Hexanone	5.00 - 5.00	0 / 4	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	5.00 - 5.00	0 / 4	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	5.00 - 5.00	0 / 4	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Benzene	1.00 - 1.00	0 / 4	--	--	109	-- / --	0.0092	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.00 - 1.00	0 / 4	--	--	640	-- / --	0.0016	0.50	0.001	--	--	--	--	--	No	HQ less than one, not detected
Bromomethane	1.10 - 1.10	0 / 4	--	--	120	-- / --	0.0092	0.55	0.005	--	--	--	--	--	No	HQ less than one, not detected
Carbon disulfide	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	1.00 - 1.00	0 / 4	--	--	1,500	-- / --	6.67E-04	0.50	3.333E-04	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.00 - 1.00	0 / 4	--	--	105	-- / --	0.0095	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Chloroform	1.00 - 1.00	0 / 4	--	--	815	-- / --	0.0012	0.50	0.001	--	--	--	--	--	No	HQ less than one, not detected
Chloromethane	1.00 - 1.00	0 / 4	--	--	2,700	-- / --	3.70E-04	0.50	1.852E-04	--	--	--	--	--	No	HQ less than one, not detected
cis-1,2-Dichloroethene	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.00 - 1.00	0 / 4	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Cyclohexane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dibromochloromethane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	1.00 - 1.00	0 / 4	--	--	4.30	-- / --	0.23	0.50	0.12	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.00 - 1.00	1 / 4	4.90	IR15-TW03D-09C	NSV	-- / --	NSV	1.60	NSV	--	--	255	TCEO, 2006	0.0192	No	Supplemental HQ less than one
Methyl acetate	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylcyclohexane	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	1.00 - 1.00	0 / 4	--	--	2,560	-- / --	3.91E-04	0.50	1.953E-04	--	--	--	--	--	No	HQ less than one, not detected
Methyl-tert-butyl ether (MTBE)	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.00 - 1.00	1 / 4	5.90	IR15-TW03D-09C	NSV	-- / --	NSV	1.85	NSV	--	--	455	TCEO, 2006	0.0130	No	Supplemental HQ less than one
Tetrachloroethene	1.10 - 1.10	0 / 4	--	--	45.0	-- / --	0.024	0.55	0.012	--	--	--	--	--	No	HQ less than one, not detected
Toluene	1.00 - 1.00	0 / 4	--	--	37.0	-- / --	0.027	0.50	0.014	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
trans-1,3-Dichloropropene	1.00 - 1.00	0 / 4	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Trichloroethene	5.10 - 5.10	0 / 4	--	--	NSV	-- / --	NSV	2.55	NSV	--	--	--	--	--	No	No screening value, not detected
Trichlorofluoromethane(Freon-11)	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	1.00 - 1.00	0 / 4	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Xylene, total	1.20 - 1.20	0 / 4	--	--	NSV	-- / --	NSV	0.60	NSV	--	--	--	--	--	No	No screening value, not detected
Semivolatile Organic Compounds (UG/L)																
1,1-Biphenyl	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2,2'-Oxybis(1-chloropropane)	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dichlorophenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dimethylphenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-6

ERS Groundwater Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
2,4-Dinitrophenol	20.0 - 22.0	0 / 3	--	--	48.5	-- / --	0.45	10.5	0.22	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chlorophenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylnaphthalene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylphenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitroaniline	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	20.0 - 22.0	0 / 3	--	--	NSV	-- / --	NSV	10.5	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	20.0 - 22.0	0 / 3	--	--	NSV	-- / --	NSV	10.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chlorophenyl-phenylether	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	20.0 - 22.0	0 / 3	--	--	NSV	-- / --	NSV	10.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitroaniline	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	20.0 - 22.0	0 / 3	--	--	71.7	-- / --	0.31	10.5	0.15	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	10.0 - 11.0	0 / 3	--	--	9.70	-- / --	1.13	5.33	0.55	--	--	--	--	--	No	No screening value, not detected
Acenaphthylene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Acetophenone	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Atrazine	20.0 - 22.0	0 / 3	--	--	NSV	-- / --	NSV	10.5	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)pyrene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(b)fluoranthene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(g,h,i)perylene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(k)fluoranthene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethoxy)methane	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Butylbenzylphthalate	10.0 - 11.0	0 / 3	--	--	29.4	-- / --	0.37	5.33	0.18	--	--	--	--	--	No	HQ less than one, not detected
Caprolactam	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenz(a,h)anthracene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenzofuran	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	10.0 - 11.0	0 / 3	--	--	759	-- / --	0.014	5.33	0.007	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	10.0 - 11.0	0 / 3	--	--	580	-- / --	0.019	5.33	0.009	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	20.0 - 22.0	0 / 3	--	--	3.40	-- / --	6.47	10.5	3.09	--	--	--	--	--	No	Not detected
Di-n-octylphthalate	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Fluoranthene	10.0 - 11.0	0 / 3	--	--	1.60	-- / --	6.88	5.33	3.33	--	--	--	--	--	No	Not detected
Fluorene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobenzene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobutadiene	10.0 - 11.0	0 / 3	--	--	0.32	-- / --	34.4	5.33	17	--	--	--	--	--	No	Not detected
Hexachlorocyclopentadiene	10.0 - 11.0	0 / 3	--	--	0.070	-- / --	157	5.33	76	--	--	--	--	--	No	Not detected
Hexachloroethane	10.0 - 11.0	0 / 3	--	--	9.40	-- / --	1.17	5.33	0.57	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Isophorone	10.0 - 11.0	0 / 3	--	--	129	-- / --	0.085	5.33	0.041	--	--	--	--	--	No	HQ less than one, not detected
Naphthalene	10.0 - 11.0	0 / 3	--	--	23.5	-- / --	0.47	5.33	0.23	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	10.0 - 11.0	0 / 3	--	--	33,000	-- / --	3.33E-04	5.33	1.616E-04	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	10.0 - 11.0	0 / 3	--	--	66.8	-- / --	0.16	5.33	0.08	--	--	--	--	--	No	HQ less than one, not detected



Table F-6

ERS Groundwater Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Pentachlorophenol	20.0 - 22.0	0 / 3	--	--	7.90	-- / --	2.78	10.5	1.33	--	--	--	--	--	No	Not detected
Phenanthrene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Phenol	10.0 - 11.0	0 / 3	--	--	58.0	-- / --	0.19	5.33	0.092	--	--	--	--	--	No	HQ less than one, not detected
Pyrene	10.0 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	5.33	NSV	--	--	--	--	--	No	No screening value, not detected
Pesticide/Polychlorinated Biphenyls (UG/L)																
4,4'-DDD	0.051 - 0.053	0 / 3	--	--	0.025	-- / --	2.12	0.026	1.04	--	--	--	--	--	No	Not detected
4,4'-DDE	0.051 - 0.053	0 / 3	--	--	0.14	-- / --	0.38	0.026	0.19	--	--	--	--	--	No	HQ less than one, not detected
4,4'-DDT	0.051 - 0.053	0 / 3	--	--	0.0010	-- / --	53.0	0.026	26	--	--	--	--	--	No	Not detected
Aldrin	0.051 - 0.053	0 / 3	--	--	0.13	-- / --	0.41	0.026	0.2	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	0.051 - 0.053	0 / 3	--	--	1,400	-- / --	3.79E-05	0.026	1.857E-05	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	0.051 - 0.053	0 / 3	--	--	0.0040	-- / --	13.3	0.026	6.5	--	--	--	--	--	No	Not detected
Aroclor-1016	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1221	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1232	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1242	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1248	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1254	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
Aroclor-1260	0.51 - 0.53	0 / 3	--	--	0.030	-- / --	17.7	0.26	8.67	--	--	--	--	--	No	Not detected
beta-BHC	0.051 - 0.053	0 / 3	--	--	NSV	-- / --	NSV	0.026	NSV	--	--	--	--	--	No	No screening value, not detected
delta-BHC	0.051 - 0.053	0 / 3	--	--	NSV	-- / --	NSV	0.026	NSV	--	--	--	--	--	No	No screening value, not detected
Dieldrin	0.051 - 0.053	0 / 3	--	--	0.0019	-- / --	27.9	0.026	14	--	--	--	--	--	No	Not detected
Endosulfan I	0.051 - 0.053	0 / 3	--	--	0.0087	-- / --	6.09	0.026	2.99	--	--	--	--	--	No	Not detected
Endosulfan II	0.051 - 0.053	0 / 3	--	--	0.0087	-- / --	6.09	0.026	2.99	--	--	--	--	--	No	Not detected
Endosulfan sulfate	0.051 - 0.053	0 / 3	--	--	NSV	-- / --	NSV	0.026	NSV	--	--	--	--	--	No	Not detected
Endrin	0.051 - 0.053	0 / 3	--	--	0.0023	-- / --	23.0	0.026	11	--	--	--	--	--	No	Not detected
Endrin aldehyde	0.051 - 0.053	0 / 3	--	--	NSV	-- / --	NSV	0.026	NSV	--	--	--	--	--	No	No screening value, not detected
Endrin ketone	0.051 - 0.053	0 / 3	--	--	NSV	-- / --	NSV	0.026	NSV	--	--	--	--	--	No	No screening value, not detected
gamma-BHC (Lindane)	0.051 - 0.053	0 / 3	--	--	0.016	-- / --	3.31	0.026	1.63	--	--	--	--	--	No	Not detected
gamma-Chlordane	0.051 - 0.053	0 / 3	--	--	0.0040	-- / --	13.3	0.026	6.50	--	--	--	--	--	No	Not detected
Heptachlor	0.051 - 0.053	0 / 3	--	--	0.0036	-- / --	14.7	0.026	7.22	--	--	--	--	--	No	Not detected
Heptachlor epoxide	0.051 - 0.053	0 / 3	--	--	0.0036	-- / --	14.7	0.026	7.22	--	--	--	--	--	No	Not detected
Methoxychlor	0.051 - 0.053	0 / 3	--	--	0.030	-- / --	1.77	0.026	0.87	--	--	--	--	--	No	Not detected
Toxaphene	1.00 - 1.10	0 / 3	--	--	0.0020	-- / --	550	0.52	258	--	--	--	--	--	No	Not detected
Inorganics (UG/L)																
Aluminum	-- - --	5 / 5	3,360	IR15-TW05-09C	NSV	-- / --	NSV	895	NSV	1886	Yes	--	--	--	No	Within background range
Antimony	20.0 - 20.0	0 / 5	--	--	NSV	-- / --	NSV	10.0	NSV	3.28	--	--	--	--	No	No screening value, not detected
Arsenic	20.0 - 20.0	1 / 5	3.20	IR15-TW04-09C	36.0	0 / 5	0.089	8.64	0.24	5.77	No	--	--	--	No	Consistent with background
Barium	-- - --	5 / 5	95.0	IR15-TW03D-09C	NSV	-- / --	NSV	38.1	NSV	86.2	Yes	--	--	--	No	Within background range
Beryllium	2.00 - 2.00	1 / 5	0.18	IR15-TW03D-09C	NSV	-- / --	NSV	0.84	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium	6.00 - 6.00	0 / 5	--	--	8.80	-- / --	0.68	3.00	0.34	0.358	--	--	--	--	No	HQ less than one, not detected
Calcium <sup>3</sup>	-- - --	5 / 5	45,500	IR15-TW04-09C	NSV	-- / --	NSV	24,638	NSV	69078	No	--	--	--	No	Macronutrient
Chromium	20.0 - 20.0	2 / 5	5.00	IR15-TW05-09C	50.0	0 / 5	0.10	7.34	0.15	3.13	Yes	--	--	--	No	HQ less than one, detected
Cobalt	5.00 - 5.00	4 / 5	3.90	IR15-TW01-09C	NSV	-- / --	NSV	2.06	NSV	3.4	Yes	--	--	--	No	Within background range
Copper	20.0 - 20.0	3 / 5	3.80	IR15-TW05-09C	3.10	1 / 5	1.23	5.90	1.90	2.76	Yes	--	--	--	No	Within background range
Iron	-- - --	5 / 5	25,800	IR15-TW01-09C	NSV	-- / --	NSV	9,360	NSV	5999	Yes	--	--	--	No	Within background range
Lead	20.0 - 20.0	0 / 5	--	--	8.10	-- / --	2.47	10.0	1.23	2.80	--	--	--	--	No	Not detected
Magnesium <sup>3</sup>	-- - --	5 / 5	4,620	IR15-TW03D-09C	NSV	-- / --	NSV	2,081	NSV	6363	No	--	--	--	No	Macronutrient
Manganese	-- - --	5 / 5	439	IR15-TW01-09C	NSV	-- / --	NSV	146	NSV	214	Yes	--	--	--	No	Within background range
Mercury	0.20 - 0.20	0 / 5	--	--	0.94	-- / --	0.21	0.10	0.11	0.1	--	--	--	--	No	HQ less than one, not detected
Nickel	10.0 - 10.0	4 / 5	30.0	IR15-TW01-09C	8.20	3 / 5	3.66	14.1	1.72	7.97	Yes	--	--	--	No	Within background range
Potassium <sup>3</sup>	-- - --	5 / 5	2,540	IR15-TW02-09C	NSV	-- / --	NSV	1,370	NSV	3277	No	--	--	--	No	Macronutrient
Selenium	20.0 - 20.0	0 / 5	--	--	71.0	-- / --	0.28	10.0	0.14	3.14	--	--	--	--	No	HQ less than one, not detected
Silver	20.0 - 20.0	0 / 5	--	--	0.23	-- / --	87.0	10.0	43	0.77	--	--	--	--	No	Not detected



Table F-6  
ERS Groundwater Screen for Site 15  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Sodium <sup>3</sup>	-- - --	5 / 5	8,000	IR15-TW03D-09C	NSV	-- / --	NSV	4,426	NSV	22508	No	--	--	--	No	Macronutrient
Thallium	30.0 - 30.0	1 / 5	3.20	IR15-TW04-09C	21.3	0 / 5	0.15	12.6	0.59	3.78	No	--	--	--	No	Consistent with background
Vanadium	50.0 - 50.0	0 / 5	--	--	NSV	-- / --	NSV	25.0	NSV	4.72	--	--	--	--	No	No screening value, not detected
Zinc	-- - --	5 / 5	10.9	IR15-TW03D-09C	81.0	0 / 5	0.13	7.60	0.09	42.1	No	--	--	--	No	Consistent with background
Dissolved Metals (UG/L)																
Aluminum, Dissolved	1,000 - 1,000	2 / 5	629	IR15-TW03D-09C	NSV	-- / --	NSV	434	NSV	1886	No	--	--	--	No	Consistent with background
Antimony, Dissolved	20.0 - 20.0	0 / 5	--	--	NSV	-- / --	NSV	10.0	NSV	3.28	--	--	--	--	No	No screening value, not detected
Arsenic, Dissolved	20.0 - 20.0	0 / 5	--	--	36.0	-- / --	0.56	10.0	0.28	5.77	--	--	--	--	No	HQ less than one, not detected
Barium, Dissolved	20.0 - 20.0	4 / 5	96.8	IR15-TW03D-09C	NSV	-- / --	NSV	35.5	NSV	86.2	Yes	--	--	--	No	Within background range
Beryllium, Dissolved	2.00 - 2.00	2 / 5	0.21	IR15-TW03D-09C	NSV	-- / --	NSV	0.66	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium, Dissolved	6.00 - 6.00	0 / 5	--	--	8.80	-- / --	0.68	3.00	0.34	0.358	--	--	--	--	No	HQ less than one, not detected
Calcium, Dissolved <sup>3</sup>	-- - --	5 / 5	44,100	IR15-TW04-09C	NSV	-- / --	NSV	23,938	NSV	69078	No	--	--	--	No	Macronutrient
Chromium, Dissolved	20.0 - 20.0	0 / 5	--	--	50.0	-- / --	0.40	10.0	0.20	3.13	--	--	--	--	No	HQ less than one, not detected
Cobalt, Dissolved	5.00 - 5.00	4 / 5	3.10	IR15-TW01-09C	NSV	-- / --	NSV	1.58	NSV	3.4	No	--	--	--	No	Consistent with background
Copper, Dissolved	20.0 - 20.0	3 / 5	4.60	IR15-TW02-09C	3.10	1 / 5	1.48	6.00	1.94	2.76	Yes	--	--	--	No	Within background range
Iron, Dissolved	-- - --	5 / 5	20,500	IR15-TW01-09C	NSV	-- / --	NSV	7,426	NSV	5999	Yes	--	--	--	No	Within background range
Lead, Dissolved	20.0 - 20.0	0 / 5	--	--	8.10	-- / --	2.47	10.0	1.23	2.8	--	--	--	--	No	Not detected
Magnesium, Dissolved <sup>3</sup>	-- - --	5 / 5	4,740	IR15-TW03D-09C	NSV	-- / --	NSV	2,042	NSV	6363	No	--	--	--	No	Macronutrient
Manganese, Dissolved	-- - --	5 / 5	236	IR15-TW01-09C	NSV	-- / --	NSV	108	NSV	214	Yes	--	--	--	No	Within background range
Mercury, Dissolved	0.20 - 0.20	0 / 5	--	--	0.94	-- / --	0.21	0.10	0.11	0.1	--	--	--	--	No	HQ less than one, not detected
Nickel, Dissolved	10.0 - 10.0	3 / 5	25.0	IR15-TW01-09C	8.20	-- / --	1.22	13.7	1.67	7.97	Yes	--	--	--	No	Within background range
Potassium, Dissolved <sup>3</sup>	-- - --	5 / 5	2,460	IR15-TW02-09C	NSV	-- / --	NSV	1,284	NSV	3277	No	--	--	--	No	Macronutrient
Selenium, Dissolved	20.0 - 20.0	0 / 5	--	--	71.0	-- / --	0.28	10.0	0.14	3.14	--	--	--	--	No	HQ less than one, not detected
Silver, Dissolved	20.0 - 20.0	0 / 5	--	--	0.23	-- / --	86.96	10.0	43	0.77	--	--	--	--	No	Not detected
Sodium, Dissolved <sup>3</sup>	-- - --	5 / 5	8,120	IR15-TW03D-09C	NSV	-- / --	NSV	4,380	NSV	22508	No	--	--	--	No	Macronutrient
Thallium, Dissolved	30.0 - 30.0	0 / 5	--	--	21.3	-- / --	1.41	15.0	0.70	3.78	--	--	--	--	No	Not detected
Vanadium, Dissolved	50.0 - 50.0	0 / 5	--	--	NSV	-- / --	NSV	25.0	NSV	4.72	--	--	--	--	No	No screening value, not detected
Zinc, Dissolved	50.0 - 50.0	2 / 5	12.1	IR15-TW03D-09C	81.0	-- / --	0.62	19.4	0.24	42.1	No	--	--	--	No	Consistent with background

NOTES  
1 - Marine screening values  
2 - Count of detected samples exceeding or equaling Screening Value  
3 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
UG/L - Micrograms per liter  
NSV - No Screening Value  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-7  
ERS Surface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum HQ	Arithmetic Mean Concentration	Mean HQ	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethane	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	4.60 - 6.50	0 / 4	--	--	10.0	-- / --	0.65	2.66	0.27	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromo-3-chloropropane	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dibromoethane	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	4.60 - 6.50	0 / 4	--	--	10.0	-- / --	0.65	2.66	0.27	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	4.60 - 6.50	0 / 4	--	--	400	-- / --	0.016	2.66	0.007	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	4.60 - 6.50	0 / 4	--	--	700,000	-- / --	9.29E-06	2.66	0.000	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	4.60 - 6.50	0 / 4	--	--	10.0	-- / --	0.65	2.66	0.27	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	4.60 - 6.50	0 / 4	--	--	10.0	-- / --	0.65	2.66	0.27	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	11.0 - 11.0	4 / 5	23.0	IR17-SS04-00-01-09C	NSV	-- / --	NSV	10.1	NSV	--	--	89,600	Buchman, 2008	8.48E-05	No	Supplemental HQ less than one, common Lab contaminant
2-Hexanone	9.20 - 13.0	0 / 4	--	--	NSV	-- / --	NSV	5.36	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	9.20 - 13.0	0 / 4	--	--	NSV	-- / --	NSV	5.36	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	11.0 - 11.0	4 / 5	900	IR17-SS04-00-01-09C	NSV	-- / --	NSV	346	NSV	--	--	2500	Buchman, 2008	4.45E-02	No	Supplemental HQ less than one, common lab contaminant
Benzene	4.60 - 6.50	0 / 4	--	--	50.0	-- / --	0.13	2.66	0.053	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Bromomethane	9.20 - 11.0	0 / 3	--	--	NSV	-- / --	NSV	4.98	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon disulfide	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	4.60 - 6.50	0 / 4	--	--	1,000,000	-- / --	6.50E-06	2.66	2.663E-06	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	4.60 - 6.50	0 / 4	--	--	50.0	-- / --	0.13	2.66	0.053	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	9.20 - 13.0	0 / 4	--	--	100	-- / --	0.13	5.36	0.054	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	4.80 - 6.50	1 / 4	13.0	IR17-SS02-00-01-09C	1.00	1 / 4	13.0	5.34	5.34	--	--	--	--	--	No	Common lab contaminant
Chloromethane	9.20 - 11.0	1 / 4	6.50	IR17-SS01-00-01-09C	NSV	-- / --	NSV	5.36	NSV	--	--	10,400	Buchman, 2008	5.11E-04	No	Supplemental HQ less than one
cis-1,2-Dichloroethene	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Cyclohexane	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	4.60 - 6.50	0 / 4	--	--	50.0	-- / --	0.13	2.66	0.053	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	6.50 - 6.50	4 / 5	70.0	IR17-SS04-00-01-09C	NSV	-- / --	NSV	17.6	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methylcyclohexane	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	9.20 - 13.0	0 / 4	--	--	2,000	-- / --	0.0065	5.36	0.003	--	--	--	--	--	No	HQ less than one, not detected
Methyl-tert-butyl ether (MTBE)	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
Tetrachloroethene	4.60 - 6.50	0 / 4	--	--	10.0	-- / --	0.65	2.66	0.27	--	--	--	--	--	No	HQ less than one, not detected
Toluene	4.60 - 6.50	0 / 4	--	--	50.0	-- / --	0.13	2.66	0.053	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	4.60 - 6.50	0 / 4	--	--	100	-- / --	0.065	2.66	0.027	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected
Trichloroethene	4.60 - 6.50	0 / 4	--	--	1.00	-- / --	6.50	2.66	2.66	--	--	--	--	--	No	Not detected
Trichlorofluoromethane(Freon-11)	4.60 - 6.50	0 / 4	--	--	NSV	-- / --	NSV	2.66	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-7  
ERS Surface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum HQ	Arithmetic Mean Concentration	Mean HQ	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Vinyl chloride	9.20 - 13.0	0 / 4	--	--	10.0	-- / --	1.30	5.36	0.54	--	--	--	--	--	No	Not detected
Xylene, total	4.60 - 6.50	0 / 4	--	--	50.0	-- / --	0.13	2.66	0.053	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	180 - 240	0 / 5	--	--	60,000	-- / --	0.0040	96.0	0.002	--	--	--	--	--	No	HQ less than one, not detected
2,2'-Oxybis(1-chloropropane)	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	180 - 240	0 / 5	--	--	4,000	-- / --	0.060	96.0	0.024	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	180 - 240	0 / 5	--	--	3.00	-- / --	80.0	96.0	32	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	180 - 240	0 / 5	--	--	20,000	-- / --	0.012	96.0	0.005	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	180 - 240	0 / 5	--	--	1,000	-- / --	0.24	96.0	0.096	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	180 - 240	0 / 5	--	--	10.0	-- / --	24.0	96.0	9.6	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	180 - 240	0 / 5	--	--	500	-- / --	0.48	96.0	0.19	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	180 - 240	0 / 5	--	--	20,000	-- / --	0.012	96.0	0.005	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	180 - 240	0 / 5	--	--	500	-- / --	0.48	96.0	0.19	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	180 - 240	0 / 5	--	--	7,000	-- / --	0.034	96.0	0.014	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	Not detected, no screening value
Anthracene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	180 - 240	0 / 5	--	--	0.050	-- / --	4,800	96.0	1920	--	--	--	--	--	No	Not detected
Benzaldehyde	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	35.0 - 49.0	0 / 5	--	--	1,100	-- / --	0.045	19.1	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	35.0 - 49.0	0 / 5	--	--	1,100	-- / --	0.045	19.1	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	35.0 - 49.0	0 / 5	--	--	1,100	-- / --	0.045	19.1	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	180 - 240	0 / 5	--	--	1,100	-- / --	0.22	96.0	0.087	--	--	--	--	--	No	HQ less than one, not detected
Benzo(k)fluoranthene	180 - 240	0 / 5	--	--	1,100	-- / --	0.22	96.0	0.087	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	180 - 180	1 / 5	96.0	IR17-SS01-00-01-09C	100	0 / 5	0.96	91.2	0.912	--	--	--	--	--	No	HQ less than one, detected
Butylbenzylphthalate	180 - 240	0 / 5	--	--	100	-- / --	2.40	96.0	0.96	--	--	--	--	--	No	Not detected
Caprolactam	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	180 - 240	0 / 5	--	--	1,100	-- / --	0.22	96.0	0.087	--	--	--	--	--	No	HQ less than one, not detected
Dibenz(a,h)anthracene	35.0 - 49.0	0 / 5	--	--	1,100	-- / --	0.045	19.1	0.017	--	--	--	--	--	No	HQ less than one, not detected
Dibenzofuran	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	180 - 240	0 / 5	--	--	100,000	-- / --	0.0024	96.0	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	180 - 240	0 / 5	--	--	200,000	-- / --	0.0012	96.0	0.000	--	--	--	--	--	No	HQ less than one, not detected



Table F-7  
ERS Surface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum HQ	Arithmetic Mean Concentration	Mean HQ	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Di-n-butylphthalate	180 - 180	1 / 5	93.0	IR17-SS01-00-01-09C	200,000	0 / 5	4.65E-04	90.6	0.000	--	--	--	--	--	No	HQ less than one, detected
Di-n-octylphthalate	180 - 240	0 / 5	--	--	100	-- / --	2.40	96.0	0.96	--	--	--	--	--	No	Not detected
Fluoranthene	180 - 240	0 / 5	--	--	1,100	-- / --	0.22	96.0	0.087	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	180 - 240	0 / 5	--	--	2.50	-- / --	96.0	96.0	38	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	180 - 240	0 / 5	--	--	NSV	-- / --	NSV	96.0	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorocyclopentadiene	180 - 240	0 / 5	--	--	10,000	-- / --	0.024	96.0	0.010	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	180 - 240	0 / 5	--	--	100	-- / --	2.40	96.0	0.96	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	35.0 - 49.0	0 / 5	--	--	1,100	-- / --	0.045	19.1	0.017	--	--	--	--	--	No	HQ less than one, not detected
Isophorone	35.0 - 49.0	0 / 5	--	--	NSV	-- / --	NSV	19.1	NSV	--	--	--	--	--	No	No screening value, not detected
Naphthalene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	35.0 - 49.0	0 / 5	--	--	NSV	-- / --	NSV	19.1	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	180 - 240	0 / 5	--	--	20,000	-- / --	0.012	96.0	0.005	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	180 - 240	0 / 5	--	--	40,000	-- / --	0.0060	96.0	0.002	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	180 - 240	0 / 5	--	--	2,100	-- / --	0.11	96.0	0.046	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	180 - 240	0 / 5	--	--	29,000	-- / --	0.0083	96.0	0.003	--	--	--	--	--	No	HQ less than one, not detected
Phenol	180 - 240	0 / 5	--	--	50.0	-- / --	4.80	96.0	1.92	--	--	--	--	--	No	Not detected
Pyrene	180 - 240	0 / 5	--	--	1,100	-- / --	0.22	96.0	0.087	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	1.70 - 2.50	0 / 5	--	--	21.0	-- / --	0.12	0.96	0.046	--	--	--	--	--	No	HQ less than one, not detected
4,4'-DDE	1.80 - 1.80	4 / 5	2.20	IR17-SS05-00-01-09C	21.0	0 / 5	0.10	1.13	0.054	--	--	--	--	--	No	HQ less than one, detected
4,4'-DDT	1.80 - 2.50	3 / 5	1.90	IR17-SS02-00-01-09C	21.0	0 / 5	0.090	1.19	0.057	--	--	--	--	--	No	HQ less than one, detected
Aldrin	1.70 - 2.50	0 / 5	--	--	2.50	-- / --	1.00	0.96	0.38	--	--	--	--	--	No	HQ less than one, detected
alpha-BHC	1.70 - 2.50	0 / 5	--	--	2.50	-- / --	1.00	0.96	0.38	--	--	--	--	--	No	HQ less than one, detected
alpha-Chlordane	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1016	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1221	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1232	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1242	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1248	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1254	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
Aroclor-1260	17.0 - 24.0	0 / 5	--	--	20.0	-- / --	1.20	9.20	0.46	--	--	--	--	--	No	Not detected
beta-BHC	1.70 - 2.50	0 / 5	--	--	1.00	-- / --	2.50	0.96	0.96	--	--	--	--	--	No	Not detected
delta-BHC	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Dieldrin	1.70 - 2.50	0 / 5	--	--	4.90	-- / --	0.51	0.96	0.20	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan I	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan sulfate	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endrin	1.70 - 2.50	0 / 5	--	--	1.00	-- / --	2.50	0.96	0.96	--	--	--	--	--	No	Not detected
Endrin aldehyde	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
gamma-BHC (Lindane)	1.70 - 2.50	0 / 5	--	--	0.050	-- / --	50.0	0.96	19	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.70 - 2.50	0 / 5	--	--	100	-- / --	0.025	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Toxaphene	35.0 - 49.0	0 / 5	--	--	100	-- / --	0.49	19.1	0.19	--	--	--	--	--	No	HQ less than one, not detected
Inorganics (MG/KG)																
Aluminum	-- - --	5 / 5	7,580	IR17-SS01-00-01-09C	50.0	5 / 5	152	6,276	126	5,487	Yes	--	--	--	No	Within background range



Table F-7  
ERS Surface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum HQ	Arithmetic Mean Concentration	Mean HQ	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Antimony	1.50 - 2.10	0 / 5	--	--	0.27	-- / --	7.78	0.81	3	0.447	--	--	--	--	No	Not detected
Arsenic	-- - --	5 / 5	4.90	IR17-SS01-00-01-09C	18.0	0 / 5	0.27	2.20	0.12	0.626	Yes	--	--	--	No	HQ less than one, detected
Barium	-- - --	5 / 5	21.3	IR17-SS02-00-01-09C	330	0 / 5	0.065	16.6	0.050	14.5	Yes	--	--	--	No	Within background range
Beryllium	0.15 - 0.21	3 / 5	0.16	IR17-SS02-00-01-09C	21.0	0 / 5	0.0076	0.12	0.006	0.10	Yes	--	--	--	No	HQ less than one, detected
Cadmium	0.44 - 0.64	1 / 5	0.020	IR17-SS02-00-01-09C	0.36	0 / 5	0.056	0.20	0.56	0.033	No	--	--	--	No	Consistent with background
Calcium <sup>2</sup>	-- - --	5 / 5	372	IR17-SS01-00-01-09C	NSV	-- / --	NSV	189	NSV	6360	No	--	--	--	No	Consistent with background
Chromium	-- - --	5 / 5	8.30	IR17-SS01-00-01-09C	26.0	0 / 5	0.32	4.36	0.17	6.05	Yes	--	--	--	No	Within background range
Cobalt	0.54 - 0.54	4 / 5	0.33	IR17-SS04-00-01-09C	13.0	0 / 5	0.025	0.28	0.022	0.29	Yes	--	--	--	No	Within background range
Copper	-- - --	5 / 5	1.00	IR17-SS01-00-01-09C	28.0	0 / 5	0.036	0.87	0.031	4.83	No	--	--	--	No	Consistent with background
Iron	-- - --	5 / 5	7,640	IR17-SS01-00-01-09C	200	5 / 5	38.2	3,036	15	3245	Yes	--	--	--	No	Within background range
Lead	-- - --	5 / 5	17.1	IR17-SS01-00-01-09C	11.0	1 / 5	1.55	10.4	0.94	12.3	Yes	--	--	--	No	Within background range
Magnesium <sup>2</sup>	-- - --	5 / 5	667	IR17-SS01-00-01-09C	NSV	-- / --	NSV	277	NSV	238	Yes	--	--	--	No	Macronutrient
Manganese	-- - --	5 / 5	10.8	IR17-SS04-00-01-09C	220	0 / 5	0.049	8.76	0.040	13.7	No	--	--	--	No	Consistent with background
Mercury	0.033 - 0.033	2 / 5	0.052	IR17-SS01-00-01-09C	0.10	0 / 5	0.52	0.029	0.29	0.081	No	--	--	--	No	Consistent with background
Nickel	-- - --	5 / 5	2.00	IR17-SS02-00-01-09C	38.0	0 / 5	0.053	1.56	0.041	1.21	Yes	--	--	--	No	HQ less than one, detected
Potassium <sup>2</sup>	-- - --	5 / 5	495	IR17-SS01-00-01-09C	NSV	-- / --	NSV	195	NSV	116	Yes	--	--	--	No	Macronutrient
Selenium	1.50 - 1.50	1 / 5	0.69	IR17-SS01-00-01-09C	0.52	1 / 5	1.33	0.74	1.42	0.56	Yes	--	--	--	No	Within background range
Silver	1.50 - 1.50	1 / 5	0.40	IR17-SS01-00-01-09C	4.20	0 / 5	0.095	0.68	0.16	0.14	Yes	--	--	--	No	Within background range
Sodium <sup>2</sup>	188 - 188	4 / 5	1,870	IR17-SS01-00-01-09C	NSV	-- / --	NSV	404	NSV	80.9	Yes	--	--	--	No	Macronutrient
Thallium	2.20 - 3.20	0 / 5	--	--	1.00	-- / --	3.20	1.23	1.23	0.4	--	--	--	--	No	Not detected
Vanadium	-- - --	5 / 5	20.8	IR17-SS01-00-01-09C	7.80	1 / 5	2.67	9.16	1.17	8.9	Yes	--	--	--	No	Within background range
Zinc	5.40 - 5.40	4 / 5	5.20	IR17-SS02-00-01-09C	46.0	0 / 5	0.11	4.34	0.094	10.8	No	--	--	--	No	Consistent with background

NOTES

1 - Count of detected samples exceeding or equaling Screening Value

2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)

HQ - Hazard Quotient

NSV - No Screening Value

MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram



Table F-8  
ERS Subsurface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethane	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.40 - 2.00	1 / 5	1.10	IR17-SB01-2-4-09C	10.0	0 / 5	0.11	0.91	0.09	--	--	--	--	--	No	HQ less than one, detected
1,2-Dibromo-3-chloropropane	1.40 - 2.00	1 / 5	1.60	IR17-SB01-2-4-09C	NSV	-- / --	NSV	1.01	NSV	--	--	--	--	--	No	Uncertainty, no screening value
1,2-Dibromoethane	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.40 - 2.20	0 / 5	--	--	10.0	-- / --	0.22	0.91	0.091	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.40 - 2.20	0 / 5	--	--	400	-- / --	0.0055	0.91	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.40 - 2.20	0 / 5	--	--	700,000	-- / --	3.14E-06	0.91	1.300E-06	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.40 - 2.20	0 / 5	--	--	10.0	-- / --	0.22	0.91	0.091	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	1.40 - 2.20	0 / 5	--	--	10.0	-- / --	0.22	0.91	0.091	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	2.90 - 3.50	2 / 5	2.60	IR17-SB03-2-7-09C	NSV	-- / --	NSV	1.77	NSV	--	--	89,600	Buchman, 2008	5.42E-06	No	Supplemental HQ less than one, common lab contaminant
2-Hexanone	2.90 - 4.40	0 / 5	--	--	NSV	-- / --	NSV	1.80	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	2.90 - 4.40	0 / 5	--	--	NSV	-- / --	NSV	1.80	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	2.90 - 3.50	2 / 5	99.0	IR17-SB03-2-7-09C	NSV	-- / --	NSV	34.8	NSV	--	--	2500	Buchman, 2008	1.86E-02	No	Supplemental HQ less than one, common lab contaminant
Benzene	1.40 - 2.20	0 / 5	--	--	50.0	-- / --	0.044	0.91	0.018	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Bromomethane	2.90 - 4.40	0 / 5	--	--	NSV	-- / --	NSV	1.80	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon disulfide	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	1.40 - 2.20	0 / 5	--	--	1,000,000	-- / --	2.20E-06	0.91	9.100E-07	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.40 - 2.20	0 / 5	--	--	50.0	-- / --	0.044	0.91	0.018	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	2.90 - 4.40	0 / 5	--	--	100	-- / --	0.044	1.80	0.018	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	1.70 - 2.00	2 / 5	4.90	IR17-SB01-2-4-09C	1.00	2 / 5	4.90	1.99	1.99	--	--	--	--	--	No	Common lab contaminant
Chloromethane	2.90 - 4.40	0 / 5	--	--	NSV	-- / --	NSV	1.80	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,2-Dichloroethene	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Cyclohexane	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	1.40 - 2.20	0 / 5	--	--	50.0	-- / --	0.044	0.91	0.018	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	1.40 - 1.40	4 / 5	96.0	IR17-SB03-2-7-09C	NSV	-- / --	NSV	20.9	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methylcyclohexane	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	1.40 - 3.30	1 / 5	1.50	IR17-SB03-2-7-09C	2,000	0 / 5	7.50E-04	1.17	0.001	--	--	--	--	--	No	HQ less than one, detected
Methyl-tert-butyl ether (MTBE)	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
Tetrachloroethene	1.40 - 2.20	0 / 5	--	--	10.0	-- / --	0.22	0.91	0.091	--	--	--	--	--	No	HQ less than one, not detected
Toluene	1.40 - 2.20	0 / 5	--	--	50.0	-- / --	0.044	0.91	0.018	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	1.40 - 2.20	0 / 5	--	--	100	-- / --	0.022	0.91	0.009	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Trichloroethene	1.40 - 2.20	0 / 5	--	--	1.00	-- / --	2.20	0.91	0.91	--	--	--	--	--	No	Not detected
Trichlorofluoromethane(Freon-11)	1.40 - 2.20	0 / 5	--	--	NSV	-- / --	NSV	0.91	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	2.90 - 3.50	0 / 4	--	--	10.0	-- / --	0.35	1.65	0.17	--	--	--	--	--	No	HQ less than one, not detected
Xylene, total	1.40 - 2.20	0 / 5	--	--	50.0	-- / --	0.044	0.91	0.018	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	190 - 220	0 / 5	--	--	60,000	-- / --	0.004	101	0.002	--	--	--	--	--	No	HQ less than one, not detected
2,2'-Oxybis(1-chloropropane)	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	190 - 220	0 / 5	--	--	4,000	-- / --	0.055	101	0.025	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	190 - 220	0 / 5	--	--	3.00	-- / --	73	101	34	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	190 - 220	0 / 5	--	--	20,000	-- / --	0.011	101	0.005	--	--	--	--	--	No	HQ less than one, not detected



Table F-8  
ERS Subsurface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
2,4-Dinitrotoluene	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	190 - 220	0 / 5	--	--	1,000	-- / --	0.22	101	0.10	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	190 - 220	0 / 5	--	--	10.0	-- / --	22	101	10.1	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	190 - 220	0 / 5	--	--	500	-- / --	0.44	101	0.20	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	190 - 220	0 / 5	--	--	20,000	-- / --	0.011	101	0.005	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	190 - 220	0 / 5	--	--	500	-- / --	0.44	101	0.20	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	190 - 220	0 / 5	--	--	7,000	-- / --	0.031	101	0.014	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	190 - 220	0 / 5	--	--	0.050	-- / --	4,400	101	2020	--	--	--	--	--	No	Not detected
Benzo(a)anthracene	37.0 - 44.0	0 / 5	--	--	1,100	-- / --	0.040	20.1	0.018	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	37.0 - 44.0	0 / 5	--	--	1,100	-- / --	0.040	20.1	0.018	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	37.0 - 44.0	0 / 5	--	--	1,100	-- / --	0.040	20.1	0.018	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	190 - 220	0 / 5	--	--	1,100	-- / --	0.20	101	0.092	--	--	--	--	--	No	HQ less than one, not detected
Benzo(k)fluoranthene	190 - 220	0 / 5	--	--	1,100	-- / --	0.20	101	0.092	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	190 - 220	0 / 5	--	--	100	-- / --	2.20	101	1.01	--	--	--	--	--	No	Not detected
Butylbenzylphthalate	190 - 220	0 / 5	--	--	100	-- / --	2.20	101	1.01	--	--	--	--	--	No	Not detected
Caprolactam	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	190 - 220	0 / 5	--	--	1,100	-- / --	0.20	101	0.092	--	--	--	--	--	No	HQ less than one, not detected
Dibenz(a,h)anthracene	37.0 - 44.0	0 / 5	--	--	1,100	-- / --	0.040	20.1	0.018	--	--	--	--	--	No	HQ less than one, not detected
Dibenzofuran	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	190 - 220	0 / 5	--	--	100,000	-- / --	0.0022	101	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	190 - 220	0 / 5	--	--	200,000	-- / --	0.0011	101	0.001	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	190 - 220	0 / 5	--	--	200,000	-- / --	0.0011	101	0.001	--	--	--	--	--	No	HQ less than one, not detected
Di-n-octylphthalate	190 - 220	0 / 5	--	--	100	-- / --	2.20	101	1.01	--	--	--	--	--	No	Not detected
Fluoranthene	190 - 220	0 / 5	--	--	1,100	-- / --	0.20	101	0.092	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	190 - 220	0 / 5	--	--	2.50	-- / --	88	101	40	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	190 - 220	0 / 5	--	--	NSV	-- / --	NSV	101	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorocyclopentadiene	190 - 220	0 / 5	--	--	10,000	-- / --	0.022	101	0.010	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	190 - 220	0 / 5	--	--	100	-- / --	2.20	101	1.01	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	37.0 - 44.0	0 / 5	--	--	1,100	-- / --	0.040	20.1	0.018	--	--	--	--	--	No	HQ less than one, not detected
Isophorone	37.0 - 44.0	0 / 5	--	--	NSV	-- / --	NSV	20.1	NSV	--	--	--	--	--	No	No screening value, not detected
Naphthalene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	37.0 - 44.0	0 / 5	--	--	NSV	-- / --	NSV	20.1	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	190 - 220	0 / 5	--	--	20,000	-- / --	0.011	101	0.005	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	190 - 220	0 / 5	--	--	40,000	-- / --	0.0055	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	190 - 220	0 / 5	--	--	2,100	-- / --	0.10	101	0.048	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	190 - 220	0 / 5	--	--	29,000	-- / --	0.0076	101	0.003	--	--	--	--	--	No	HQ less than one, not detected
Phenol	190 - 220	0 / 5	--	--	50.0	-- / --	4.40	101	2.02	--	--	--	--	--	No	Not detected
Pyrene	190 - 220	0 / 5	--	--	1,100	-- / --	0.20	101	0.092	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																



Table F-8  
ERS Subsurface Soil Screen for Site 17  
Camp Johnson Consutrction Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
4,4'-DDD	1.70 - 1.70	0 / 5	--	--	21.0	-- / --	0.081	0.85	0.040	--	--	--	--	--	No	HQ less than one, not detected
4,4'-DDE	1.70 - 1.70	1 / 5	0.41	IR17-SB05-2-7-09C	21.0	0 / 5	0.020	0.76	0.036	--	--	--	--	--	No	HQ less than one, detected
4,4'-DDT	1.70 - 1.70	0 / 5	--	--	21.0	-- / --	0.081	0.85	0.040	--	--	--	--	--	No	HQ less than one, not detected
Aldrin	1.70 - 1.70	0 / 5	--	--	2.50	-- / --	0.68	0.85	0.34	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	1.70 - 1.70	0 / 5	--	--	2.50	-- / --	0.68	0.85	0.34	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1016	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1221	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1232	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1242	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1248	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1254	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
Aroclor-1260	19.0 - 22.0	0 / 5	--	--	20.0	-- / --	1.10	10.1	0.51	--	--	--	--	--	No	Not detected
beta-BHC	1.70 - 1.70	0 / 5	--	--	1.00	-- / --	1.70	0.85	0.85	--	--	--	--	--	No	Not detected
delta-BHC	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Dieldrin	1.70 - 1.70	0 / 5	--	--	4.90	-- / --	0.35	0.85	0.17	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan I	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan sulfate	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endrin	1.70 - 1.70	0 / 5	--	--	1.00	-- / --	1.70	0.85	0.85	--	--	--	--	--	No	Not detected
Endrin aldehyde	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
gamma-BHC (Lindane)	1.70 - 1.70	0 / 5	--	--	0.050	-- / --	34.0	0.85	17	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.70 - 1.70	0 / 5	--	--	100	-- / --	0.017	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
Toxaphene	33.0 - 33.0	0 / 5	--	--	100	-- / --	0.33	16.5	0.17	--	--	--	--	--	No	HQ less than one, not detected
<b>Inorganics (MG/KG)</b>																
Aluminum	-- - --	5 / 5	20,000	IR17-SB03-2-7-09C	50.0	5 / 5	400	11,018	220	10,369	Yes	--	--	--	No	See text discussion
Antimony	1.60 - 1.80	1 / 5	0.93	IR17-SB01-2-4-09C	0.27	1 / 5	3.44	0.86	3.17	0.36	Yes	--	--	--	No	Low magnitude of exceedance
Arsenic	-- - --	5 / 5	14.6	IR17-SB03-2-7-09C	18.0	0 / 5	0.81	5.31	0.30	2.12	Yes	--	--	--	No	HQ less than one, detected
Barium	-- - --	5 / 5	21.8	IR17-SB03-2-7-09C	330	0 / 5	0.066	15.3	0.046	16.6	Yes	--	--	--	No	Within background range
Beryllium	-- - --	5 / 5	0.31	IR17-SB03-2-7-09C	21.0	0 / 5	0.015	0.16	0.007	0.165	Yes	--	--	--	No	Within background range
Cadmium	0.47 - 0.55	0 / 5	--	--	0.36	-- / --	1.53	0.26	0.71	0.023	--	--	--	--	No	Not detected
Calcium <sup>2</sup>	84.6 - 92.0	2 / 5	227	IR17-SB04-2-7-09C	NSV	-- / --	NSV	91.5	NSV	441	No	--	--	--	No	Consistent with background
Chromium	-- - --	5 / 5	35.8	IR17-SB03-2-7-09C	26.0	2 / 5	1.38	16.2	0.62	14.5	Yes	--	--	--	No	Low magnitude of exceedance, mean HQ less than one
Cobalt	-- - --	5 / 5	1.10	IR17-SB03-2-7-09C	13.0	0 / 5	0.085	0.58	0.044	0.822	Yes	--	--	--	No	HQ less than one, detected
Copper	-- - --	5 / 5	5.00	IR17-SB03-2-7-09C	28.0	0 / 5	0.18	2.30	0.082	2.56	Yes	--	--	--	No	HQ less than one, detected
Iron	-- - --	5 / 5	28,400	IR17-SB03-2-7-09C	200	5 / 5	142	11,154	56	5,439	Yes	--	--	--	No	Micronutrient
Lead	-- - --	5 / 5	15.9	IR17-SB03-2-7-09C	11.0	1 / 5	1.45	8.36	0.76	8.49	Yes	50	Region 4 (EPA, 2001)	0.318	No	Low magnitude of exceedance, HQ less than one based on Region 4 screening value.
Magnesium <sup>2</sup>	-- - --	5 / 5	1,020	IR17-SB03-2-7-09C	NSV	-- / --	NSV	492	NSV	363	Yes	--	--	--	No	Macronutrient
Manganese	-- - --	5 / 5	13.3	IR17-SB03-2-7-09C	220	0 / 5	0.060	9.92	0.045	9.25	Yes	--	--	--	No	Within background range
Mercury	0.033 - 0.041	1 / 5	0.049	IR17-SB05-2-7-09C	0.10	0 / 5	0.49	0.025	0.25	0.071	No	--	--	--	No	Consistent with background
Nickel	-- - --	5 / 5	2.70	IR17-SB03-2-7-09C	38.0	0 / 5	0.071	1.84	0.048	2.27	Yes	--	--	--	No	Within background range
Potassium <sup>2</sup>	-- - --	5 / 5	1,070	IR17-SB03-2-7-09C	NSV	-- / --	NSV	508	NSV	361	Yes	--	--	--	No	Macronutrient
Selenium	1.60 - 1.80	1 / 5	1.40	IR17-SB03-2-7-09C	0.52	1 / 5	2.69	0.95	1.83	0.505	Yes	--	--	--	No	Low magnitude of exceedance, mean HQ less than one, barely above maximum background value of 1.3 mg/kg
Silver	1.60 - 1.80	0 / 5	--	--	4.20	-- / --	0.43	0.85	0.20	0.129	--	--	--	--	No	Not detected
Sodium <sup>2</sup>	-- - --	5 / 5	230	IR17-SB01-2-4-09C	NSV	-- / --	NSV	77.0	NSV	68.3	Yes	--	--	--	No	Macronutrient
Thallium	2.40 - 2.80	0 / 5	--	--	1.00	-- / --	2.80	1.28	1.28	0.38	--	--	--	--	No	Not detected
Vanadium	-- - --	5 / 5	70.4	IR17-SB03-2-7-09C	7.80	3 / 5	9.03	27.1	3.48	17.2	Yes	--	--	--	No	See text discussion
Zinc	-- - --	5 / 5	8.90	IR17-SB03-2-7-09C	46.0	0 / 5	0.19	5.64	0.12	6.59	Yes	--	--	--	No	Within background range



Table F-8  
ERS Subsurface Soil Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
*MCB Camp Lejeune, North Carolina*

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
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NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
HQ - Hazard Quotient  
NSV - No Screening Value  
MG/KG - Milligrams per kilogram  
UG/KG - Micrograms per kilogram



Table F-9  
ERS Groundwater Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Volatile Organic Compounds (UG/L)																
1,1,1-Trichloroethane	1.00 - 1.00	0 / 2	--	--	312	-- / --	0.0032	0.50	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.00 - 2.40	0 / 2	--	--	90.2	-- / --	0.027	0.85	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethene	1.00 - 1.00	0 / 2	--	--	2,240	-- / --	4.46E-04	0.50	2.232E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.00 - 1.00	0 / 2	--	--	4.50	-- / --	0.22	0.50	0.11	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromo-3-chloropropane	2.00 - 2.00	0 / 1	--	--	NSV	-- / --	NSV	1.00	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dibromoethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.00 - 1.00	0 / 2	--	--	19.7	-- / --	0.051	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.00 - 1.00	0 / 2	--	--	1,130	-- / --	8.85E-04	0.50	4.425E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.00 - 1.00	0 / 2	--	--	2,400	-- / --	4.17E-04	0.50	2.083E-04	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.00 - 1.00	0 / 2	--	--	28.5	-- / --	0.035	0.50	0.018	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	1.00 - 1.00	0 / 2	--	--	19.9	-- / --	0.050	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
2-Hexanone	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Benzene	1.00 - 1.00	0 / 2	--	--	109	-- / --	0.0092	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.00 - 1.00	0 / 2	--	--	640	-- / --	0.0016	0.50	0.001	--	--	--	--	--	No	HQ less than one, not detected
Bromomethane	1.00 - 1.10	0 / 2	--	--	120	-- / --	0.0092	0.53	0.004	--	--	--	--	--	No	HQ less than one, not detected
Carbon disulfide	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	1.00 - 1.00	0 / 2	--	--	1,500	-- / --	6.67E-04	0.50	3.333E-04	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.00 - 1.00	0 / 2	--	--	105	-- / --	0.0095	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Chloroform	1.00 - 1.00	1 / 2	4.40	IR17-TW01-09C	815	0 / 2	0.0054	2.45	0.003	--	--	--	--	--	No	HQ less than one, detected, common lab contaminant
Chloromethane	1.00 - 1.00	0 / 2	--	--	2,700	-- / --	3.70E-04	0.50	1.852E-04	--	--	--	--	--	No	HQ less than one, not detected
cis-1,2-Dichloroethene	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.00 - 1.00	0 / 2	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Cyclohexane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dibromochloromethane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	1.00 - 1.00	0 / 2	--	--	4.30	-- / --	0.23	0.50	0.12	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylcyclohexane	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	1.00 - 1.00	0 / 2	--	--	2,560	-- / --	3.91E-04	0.50	1.953E-04	--	--	--	--	--	No	HQ less than one, not detected
Methyl-tert-butyl ether (MTBE)	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Tetrachloroethene	1.00 - 1.10	0 / 2	--	--	45.0	-- / --	0.024	0.53	0.012	--	--	--	--	--	No	HQ less than one, not detected
Toluene	1.00 - 1.00	0 / 2	--	--	37.0	-- / --	0.027	0.50	0.014	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
trans-1,3-Dichloropropene	1.00 - 1.00	0 / 2	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Trichloroethene	1.00 - 5.10	0 / 2	--	--	NSV	-- / --	NSV	1.53	NSV	--	--	--	--	--	No	No screening value, not detected
Trichlorofluoromethane(Freon-11)	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	1.00 - 1.00	0 / 2	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Xylene, total	1.00 - 1.20	0 / 2	--	--	NSV	-- / --	NSV	0.55	NSV	--	--	--	--	--	No	No screening value, not detected
Semivolatile Organic Compounds (UG/L)																
1,1-Biphenyl	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,2'-Oxybis(1-chloropropane)	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dichlorophenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dimethylphenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	20.0 - 20.0	0 / 2	--	--	48.5	-- / --	0.41	10.0	0.21	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-9  
ERS Groundwater Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
2-Chloronaphthalene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chlorophenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylnaphthalene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylphenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitroaniline	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	20.0 - 20.0	0 / 2	--	--	NSV	-- / --	NSV	10.0	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	20.0 - 20.0	0 / 2	--	--	NSV	-- / --	NSV	10.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chlorophenyl-phenylether	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	20.0 - 20.0	0 / 2	--	--	NSV	-- / --	NSV	10.0	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitroaniline	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	20.0 - 20.0	0 / 2	--	--	71.7	-- / --	0.28	10.0	0.14	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	10.0 - 10.0	0 / 2	--	--	9.70	-- / --	1.03	5.00	0.52	--	--	--	--	--	No	Not detected
Acenaphthylene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Acetophenone	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Atrazine	20.0 - 20.0	0 / 2	--	--	NSV	-- / --	NSV	10.0	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)pyrene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(b)fluoranthene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(g,h,i)perylene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(k)fluoranthene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethoxy)methane	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Butylbenzylphthalate	10.0 - 10.0	0 / 2	--	--	29.4	-- / --	0.34	5.00	0.17	--	--	--	--	--	No	HQ less than one, not detected
Caprolactam	10.0 - 10.0	1 / 2	4.50	IR17-TW01-09C	NSV	-- / --	NSV	4.75	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Carbazole	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenz(a,h)anthracene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenzofuran	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	10.0 - 10.0	0 / 2	--	--	759	-- / --	0.013	5.00	0.007	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	10.0 - 10.0	0 / 2	--	--	580	-- / --	0.017	5.00	0.009	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	20.0 - 20.0	0 / 2	--	--	3.40	-- / --	5.88	10.0	2.94	--	--	--	--	--	No	Not detected
Di-n-octylphthalate	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Fluoranthene	10.0 - 10.0	0 / 2	--	--	1.60	-- / --	6.25	5.00	3.13	--	--	--	--	--	No	Not detected
Fluorene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobenzene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobutadiene	10.0 - 10.0	0 / 2	--	--	0.32	-- / --	31.3	5.00	16	--	--	--	--	--	No	Not detected
Hexachlorocyclopentadiene	10.0 - 10.0	0 / 2	--	--	0.070	-- / --	143	5.00	71	--	--	--	--	--	No	Not detected
Hexachloroethane	10.0 - 10.0	0 / 2	--	--	9.40	-- / --	1.06	5.00	0.53	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Isophorone	10.0 - 10.0	0 / 2	--	--	129	-- / --	0.078	5.00	0.039	--	--	--	--	--	No	HQ less than one, not detected
Naphthalene	10.0 - 10.0	0 / 2	--	--	23.5	-- / --	0.43	5.00	0.21	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	10.0 - 10.0	0 / 2	--	--	33,000	-- / --	3.03E-04	5.00	1.515E-04	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	10.0 - 10.0	0 / 2	--	--	30.0	-- / --	0.33	5.00	0.17	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	20.0 - 20.0	0 / 2	--	--	7.90	-- / --	2.53	10.0	1.27	--	--	--	--	--	No	Not detected
Phenanthrene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Phenol	10.0 - 10.0	0 / 2	--	--	58.0	-- / --	0.17	5.00	0.086	--	--	--	--	--	No	HQ less than one, not detected
Pyrene	10.0 - 10.0	0 / 2	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Pesticide/Polychlorinated Biphenyls (UG/L)																
4,4'-DDD	0.050 - 0.050	0 / 2	--	--	0.025	-- / --	2.00	0.025	1	--	--	--	--	--	No	Not detected
4,4'-DDE	0.050 - 0.050	0 / 2	--	--	0.14	-- / --	0.36	0.025	0.18	--	--	--	--	--	No	HQ less than one, not detected



Table F-9  
ERS Groundwater Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
4,4'-DDT	0.050 - 0.050	0 / 2	--	--	0.0010	-- / --	50.0	0.025	25	--	--	--	--	--	No	Not detected
Aldrin	0.050 - 0.050	0 / 2	--	--	0.13	-- / --	0.38	0.025	0.19	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	0.050 - 0.050	0 / 2	--	--	1,400	-- / --	3.57E-05	0.025	1.786E-05	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	0.050 - 0.050	0 / 2	--	--	0.0040	-- / --	12.5	0.025	6.25	--	--	--	--	--	No	Not detected
Aroclor-1016	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1221	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1232	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1242	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1248	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1254	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
Aroclor-1260	0.50 - 0.50	0 / 2	--	--	0.030	-- / --	16.7	0.25	8.33	--	--	--	--	--	No	Not detected
beta-BHC	0.050 - 0.050	0 / 2	--	--	NSV	-- / --	NSV	0.025	NSV	--	--	--	--	--	No	No screening value, not detected
delta-BHC	0.050 - 0.050	0 / 2	--	--	NSV	-- / --	NSV	0.025	NSV	--	--	--	--	--	No	No screening value, not detected
Dieldrin	0.050 - 0.050	0 / 2	--	--	0.0019	-- / --	26.3	0.025	13	--	--	--	--	--	No	Not detected
Endosulfan I	0.050 - 0.050	0 / 2	--	--	0.0087	-- / --	5.75	0.025	2.87	--	--	--	--	--	No	Not detected
Endosulfan II	0.050 - 0.050	0 / 2	--	--	0.0087	-- / --	5.75	0.025	2.87	--	--	--	--	--	No	Not detected
Endosulfan sulfate	0.050 - 0.050	0 / 2	--	--	NSV	-- / --	NSV	0.025	NSV	--	--	--	--	--	No	No screening value, not detected
Endrin	0.050 - 0.050	0 / 2	--	--	0.0023	-- / --	21.7	0.025	10.87	--	--	--	--	--	No	Not detected
Endrin aldehyde	0.050 - 0.050	0 / 2	--	--	NSV	-- / --	NSV	0.025	NSV	--	--	--	--	--	No	No screening value, not detected
Endrin ketone	0.050 - 0.050	0 / 2	--	--	NSV	-- / --	NSV	0.025	NSV	--	--	--	--	--	No	No screening value, not detected
gamma-BHC (Lindane)	0.050 - 0.050	0 / 2	--	--	0.016	-- / --	3.13	0.025	1.56	--	--	--	--	--	No	Not detected
gamma-Chlordane	0.050 - 0.050	0 / 2	--	--	0.0040	-- / --	12.5	0.025	6.25	--	--	--	--	--	No	Not detected
Heptachlor	0.050 - 0.050	0 / 2	--	--	0.0036	-- / --	13.9	0.025	6.94	--	--	--	--	--	No	Not detected
Heptachlor epoxide	0.050 - 0.050	0 / 2	--	--	0.0036	-- / --	13.9	0.025	6.94	--	--	--	--	--	No	Not detected
Methoxychlor	0.050 - 0.050	0 / 2	--	--	0.030	-- / --	1.67	0.025	0.83	--	--	--	--	--	No	Not detected
Toxaphene	1.00 - 1.00	0 / 2	--	--	0.0020	-- / --	500	0.50	250	--	--	--	--	--	No	Not detected
Inorganics (UG/L)																
Aluminum	-- - --	2 / 2	1,680	IR17-TW01-09C	NSV	-- / --	NSV	1,470	NSV	1886	No	--	--	--	No	Consistent with background
Antimony	20.0 - 20.0	0 / 2	--	--	NSV	-- / --	NSV	10.0	NSV	3.28	--	--	--	--	No	HQ less than one, not detected
Arsenic	20.0 - 20.0	0 / 2	--	--	36.0	-- / --	0.56	10.0	0.28	5.77	--	--	--	--	No	HQ less than one, not detected
Barium	-- - --	2 / 2	474	IR17-TW01-09C	NSV	-- / --	NSV	242	NSV	86.2	Yes	25.00	TCEQ, 2006	18.96	No	Barium in site soils is within the background range
Beryllium	2.00 - 2.00	1 / 2	0.16	IR17-TW02-09C	NSV	-- / --	NSV	0.58	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium	6.00 - 6.00	0 / 2	--	--	8.80	-- / --	0.68	3.00	0.34	0.358	--	--	--	--	No	HQ less than one, not detected
Calcium <sup>3</sup>	-- - --	2 / 2	111,000	IR17-TW01-09C	NSV	-- / --	NSV	55,956	NSV	69078	Yes	--	--	--	No	Macronutrient
Chromium	20.0 - 20.0	1 / 2	1.80	IR17-TW01-09C	50.0	0 / 2	0.036	5.90	0.12	3.13	No	--	--	--	No	Consistent with background
Cobalt	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	3.4	Yes	--	--	--	No	No screening value, not detected
Copper	20.0 - 20.0	0 / 2	--	--	3.10	-- / --	6.45	10.0	3.23	2.76	--	--	--	--	No	Not detected
Iron	-- - --	2 / 2	2,590	IR17-TW01-09C	NSV	-- / --	NSV	1,880	NSV	5999	No	--	--	--	No	Consistent with background
Lead	-- - --	2 / 2	3.20	IR17-TW01-09C	8.10	0 / 2	0.40	3.20	0.40	2.8	Yes	--	--	--	No	Within background range
Magnesium <sup>3</sup>	-- - --	2 / 2	57,300	IR17-TW01-09C	NSV	-- / --	NSV	28,919	NSV	6363	Yes	--	--	--	No	Macronutrient
Manganese	-- - --	2 / 2	57.5	IR17-TW01-09C	NSV	-- / --	NSV	37.6	NSV	214	No	--	--	--	No	Consistent with background
Mercury	0.20 - 0.20	1 / 2	0.25	IR17-TW01-09C	0.94	0 / 2	0.27	0.18	0.19	0.1	Yes	--	--	--	No	HQ less than one, detected
Nickel	10.0 - 10.0	1 / 2	13.8	IR17-TW01-09C	8.20	1 / 2	1.68	9.40	1.15	7.97	Yes	--	--	--	No	Within background range
Potassium <sup>3</sup>	-- - --	2 / 2	8,250	IR17-TW01-09C	NSV	-- / --	NSV	4,660	NSV	3277	Yes	--	--	--	No	Macronutrient
Selenium	20.0 - 20.0	1 / 2	4.20	IR17-TW02-09C	71.0	0 / 2	0.059	7.10	0.10	3.14	Yes	--	--	--	No	HQ less than one, detected
Silver	20.0 - 20.0	0 / 2	--	--	0.23	-- / --	87.0	10.0	43	0.77	--	--	--	--	No	Not detected
Sodium <sup>3</sup>	-- - --	2 / 2	499,000	IR17-TW01-09C	NSV	-- / --	NSV	253,235	NSV	22508	Yes	--	--	--	No	Macronutrient
Thallium	30.0 - 30.0	0 / 2	--	--	21.3	-- / --	1.41	15.0	0.70	3.78	--	--	--	--	No	Not detected
Vanadium	50.0 - 50.0	0 / 2	--	--	NSV	-- / --	NSV	25.0	NSV	4.72	Yes	--	--	--	No	No screening value, not detected
Zinc	-- - --	2 / 2	10.2	IR17-TW01-09C	81.0	0 / 2	0.13	7.95	0.098	42.1	No	--	--	--	No	Consistent with background
Dissolved Metals (UG/L)																
Aluminum, Dissolved	1,000 - 1,000	1 / 2	567	IR17-TW01-09C	NSV	-- / --	NSV	534	NSV	1886	No	--	--	--	No	Consistent with background
Antimony, Dissolved	20.0 - 20.0	0 / 2	--	--	160	-- / --	0.13	10.0	0.063	3.28	--	--	--	--	No	HQ less than one, not detected
Arsenic, Dissolved	20.0 - 20.0	0 / 2	--	--	36.0	-- / --	0.56	10.0	0.28	5.77	--	--	--	--	No	HQ less than one, not detected
Barium, Dissolved	-- - --	2 / 2	498	IR17-TW01-09C	NSV	-- / --	NSV	252	NSV	86.2	Yes	25.00	TCEQ, 2006	19.92	No	Barium in site soils is within the background range
Beryllium, Dissolved	2.00 - 2.00	1 / 2	0.10	IR17-TW02-09C	NSV	-- / --	NSV	0.55	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium, Dissolved	6.00 - 6.00	0 / 2	--	--	8.80	-- / --	0.68	3.00	0.34	0.358	--	--	--	--	No	HQ less than one, not detected



Table F-9  
ERS Groundwater Screen for Site 17  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Calcium, Dissolved <sup>3</sup>	-- - --	2 / 2	110,000	IR17-TW01-09C	NSV	-- / --	NSV	55,306	NSV	69078	Yes	--	--	--	No	Macronutrient
Chromium, Dissolved	20.0 - 20.0	0 / 2	--	--	50.0	-- / --	0.40	10.0	0.20	3.13	--	--	--	--	No	HQ less than one, not detected
Cobalt, Dissolved	5.00 - 5.00	0 / 2	--	--	NSV	-- / --	NSV	2.50	NSV	3.4	Yes	--	--	--	No	Not detected
Copper, Dissolved	20.0 - 20.0	1 / 2	3.80	IR17-TW01-09C	3.10	1 / 2	1.23	6.90	2.23	2.76	Yes	--	--	--	No	Within background range
Iron, Dissolved	-- - --	2 / 2	2,760	IR17-TW01-09C	NSV	-- / --	NSV	1,535	NSV	5999	No	--	--	--	No	Consistent with background
Lead, Dissolved	20.0 - 20.0	1 / 2	2.60	IR17-TW01-09C	8.10	0 / 2	0.32	6.30	0.78	2.8	No	--	--	--	No	Consistent with background
Magnesium, Dissolved <sup>3</sup>	-- - --	2 / 2	59,200	IR17-TW01-09C	NSV	-- / --	NSV	29,733	NSV	6363	Yes	--	--	--	No	Macronutrient
Manganese, Dissolved	-- - --	2 / 2	64.6	IR17-TW01-09C	NSV	-- / --	NSV	38.8	NSV	214	No	--	--	--	No	Consistent with background
Mercury, Dissolved	0.20 - 0.20	0 / 2	--	--	0.94	-- / --	0.21	0.10	0.11	0.1	--	--	--	--	No	HQ less than one, not detected
Nickel, Dissolved	10.0 - 10.0	1 / 2	15.9	IR17-TW01-09C	8.20	1 / 2	1.94	10.5	1.27	7.97	Yes	--	--	--	No	Within background range
Potassium, Dissolved <sup>3</sup>	-- - --	2 / 2	8,580	IR17-TW01-09C	NSV	-- / --	NSV	4,820	NSV	3277	Yes	--	--	--	No	Macronutrient
Selenium, Dissolved	20.0 - 20.0	1 / 2	4.20	IR17-TW02-09C	71.0	0 / 2	0.059	7.10	0.10	3.14	Yes	--	--	--	No	HQ less than one, detected
Silver, Dissolved	20.0 - 20.0	0 / 2	--	--	0.23	-- / --	87.0	10.0	43	0.77	--	--	--	--	No	Not detected
Sodium, Dissolved <sup>3</sup>	-- - --	2 / 2	510,000	IR17-TW01-09C	NSV	-- / --	NSV	258,905	NSV	22508	Yes	--	--	--	No	Macronutrient
Thallium, Dissolved	30.0 - 30.0	0 / 2	--	--	21.3	-- / --	1.41	15.0	0.70	3.78	--	--	--	--	No	Not detected
Vanadium, Dissolved	50.0 - 50.0	0 / 2	--	--	NSV	-- / --	NSV	25.0	NSV	4.72	Yes	--	--	--	No	No screening value, not detected
Zinc, Dissolved	-- - --	2 / 2	14.7	IR17-TW01-09C	81.0	0 / 2	0.18	11.3	0.14	42.1	No	--	--	--	No	Consistent with background

NOTES  
1 - Marine screening values  
2 - Count of detected samples exceeding or equaling Screening Value  
3 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
UG/L - Micrograms per liter  
HQ - Hazard Quotient  
NSV - No Screening Value  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-10  
ERS Surface Soil Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
1,1,2-Trichloroethane	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethane	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	4.30 - 9.50	0 / 10	--	--	10.0	-- / --	0.95	2.79	0.28	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromo-3-chloropropane	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
1,2-Dibromoethane	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
1,2-Dichlorobenzene	4.30 - 9.50	0 / 10	--	--	10.0	-- / --	0.95	2.79	0.28	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	4.30 - 9.50	0 / 10	--	--	400	-- / --	0.024	2.79	0.007	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	4.30 - 9.50	0 / 10	--	--	700,000	-- / --	1.36E-05	2.79	0.000	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	4.30 - 9.50	0 / 10	--	--	10.0	-- / --	0.95	2.79	0.28	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	4.30 - 9.50	0 / 10	--	--	10.0	-- / --	0.95	2.79	0.28	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	8.60 - 19.0	5 / 10	27.0	IR85-SS14-00-01-09C	NSV	-- / --	NSV	8.55	NSV	--	--	89,600	Buchman, 2008	9.54E-05	No	Supplemental HQ less than one, common Lab contaminant
2-Hexanone	8.60 - 19.0	0 / 10	--	--	NSV	-- / --	NSV	5.59	NSV	--	--	--	--	--	No	Not detected
4-Methyl-2-pentanone	8.60 - 19.0	0 / 10	--	--	NSV	-- / --	NSV	5.59	NSV	--	--	--	--	--	No	Not detected
Acetone	-- - --	12 / 12	1,300	IR85-SS09-00-01-09C	NSV	-- / --	NSV	266	NSV	--	--	2500	Buchman, 2008	1.06E-01	No	Supplemental HQ less than one, common Lab contaminant
Benzene	4.30 - 9.50	0 / 10	--	--	50.0	-- / --	0.19	2.79	0.056	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Bromoform	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Bromomethane	8.60 - 19.0	0 / 10	--	--	NSV	-- / --	NSV	5.59	NSV	--	--	--	--	--	No	Not detected
Carbon disulfide	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Carbon tetrachloride	4.30 - 9.50	0 / 10	--	--	1,000,000	-- / --	9.50E-06	2.79	2.79E-06	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	4.30 - 9.50	0 / 10	--	--	50.0	-- / --	0.19	2.79	0.056	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	8.60 - 19.0	0 / 10	--	--	100	-- / --	0.19	5.59	0.056	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	4.30 - 9.50	0 / 10	--	--	1.00	-- / --	9.50	2.79	2.79	--	--	--	--	--	No	Not detected
Chloromethane	8.60 - 19.0	0 / 10	--	--	NSV	-- / --	NSV	5.59	NSV	--	--	--	--	--	No	Not detected
cis-1,2-Dichloroethene	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
cis-1,3-Dichloropropene	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Cyclohexane	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Dichlorodifluoromethane (Freon-12)	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Ethylbenzene	4.30 - 9.50	0 / 10	--	--	50.0	-- / --	0.19	2.79	0.056	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Methyl acetate	-- - --	10 / 10	200	IR85-SS17-00-01-09C	NSV	-- / --	NSV	38.3	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methylcyclohexane	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Methylene chloride	8.60 - 13.0	1 / 10	14.0	IR85-SS17-00-01-09C	2,000	0 / 10	0.0070	6.04	0.003	--	--	--	--	--	No	HQ is less than one, detected
Methyl-tert-butyl ether (MTBE)	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Styrene	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
Tetrachloroethene	4.30 - 9.50	0 / 10	--	--	10.0	-- / --	0.95	2.79	0.28	--	--	--	--	--	No	HQ less than one, not detected
Toluene	4.30 - 9.50	0 / 10	--	--	50.0	-- / --	0.19	2.79	0.056	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	4.30 - 9.50	0 / 10	--	--	100	-- / --	0.095	2.79	0.028	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Trichloroethene	4.30 - 9.50	0 / 10	--	--	1.00	-- / --	9.50	2.79	2.79	--	--	--	--	--	No	Not detected
Trichlorofluoromethane(Freon-11)	4.30 - 9.50	0 / 10	--	--	NSV	-- / --	NSV	2.79	NSV	--	--	--	--	--	No	Not detected
Vinyl chloride	8.60 - 19.0	0 / 10	--	--	10.0	-- / --	1.90	5.59	0.56	--	--	--	--	--	No	Not detected
Xylene, total	4.30 - 9.50	0 / 10	--	--	50.0	-- / --	0.19	2.79	0.056	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	180 - 230	0 / 13	--	--	60,000	-- / --	0.0038	95.8	0.002	--	--	--	--	--	No	HQ less than one, not detected
2,2'-Oxybis(1-chloropropane)	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
2,4,5-Trichlorophenol	180 - 230	0 / 13	--	--	4,000	-- / --	0.058	95.8	0.024	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	180 - 230	0 / 13	--	--	3.00	-- / --	76.7	95.8	32	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
2,4-Dinitrophenol	180 - 230	0 / 13	--	--	20,000	-- / --	0.012	95.8	0.005	--	--	--	--	--	No	HQ less than one, not detected



Table F-10  
ERS Surface Soil Screen for Site 85  
Camp Johnson Consutrction Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
2,4-Dinitrotoluene	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
2,6-Dinitrotoluene	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
2-Chloronaphthalene	180 - 230	0 / 13	--	--	1,000	-- / --	0.23	95.8	0.096	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	180 - 230	0 / 13	--	--	10.0	-- / --	23.0	95.8	9.58	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	180 - 230	0 / 13	--	--	500	-- / --	0.46	95.8	0.19	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
2-Nitrophenol	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
3,3'-Dichlorobenzidine	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
3-Nitroaniline	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4,6-Dinitro-2-methylphenol	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4-Bromophenyl-phenylether	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4-Chloro-3-methylphenol	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4-Chloroaniline	180 - 230	0 / 13	--	--	20,000	-- / --	0.012	95.8	0.005	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4-Methylphenol	180 - 230	0 / 13	--	--	500	-- / --	0.46	95.8	0.19	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
4-Nitrophenol	180 - 230	0 / 13	--	--	7,000	-- / --	0.033	95.8	0.014	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Anthracene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	180 - 230	0 / 13	--	--	0.050	-- / --	4,600	95.8	1915	--	--	--	--	--	No	Not detected
Benzaldehyde	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Benzo(a)anthracene	36.0 - 47.0	0 / 13	--	--	1,100	-- / --	0.043	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	36.0 - 47.0	0 / 13	--	--	1,100	-- / --	0.043	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	36.0 - 47.0	0 / 13	--	--	1,100	-- / --	0.043	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	180 - 230	0 / 13	--	--	1,100	-- / --	0.21	95.8	0.087	--	--	--	--	--	No	HQ less than one, not detected
Benzo(k)fluoranthene	180 - 230	0 / 13	--	--	1,100	-- / --	0.21	95.8	0.087	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
bis(2-Chloroethyl)ether	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
bis(2-Ethylhexyl)phthalate	180 - 230	3 / 13	140	IR85-SS06-00-01-09C	100	1 / 13	1.40	91.7	0.92	--	--	--	--	--	No	Low frequency and magnitude of exceedance, common lab contaminant
Butylbenzylphthalate	180 - 230	0 / 13	--	--	100	-- / --	2.30	95.8	0.96	--	--	--	--	--	No	Not detected
Caprolactam	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Carbazole	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Chrysene	180 - 230	0 / 13	--	--	1,100	-- / --	0.21	95.8	0.087	--	--	--	--	--	No	HQ less than one, not detected
Dibenz(a,h)anthracene	36.0 - 47.0	0 / 13	--	--	1,100	-- / --	0.043	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Dibenzofuran	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Diethylphthalate	180 - 230	0 / 13	--	--	100,000	-- / --	0.0023	95.8	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	180 - 230	0 / 13	--	--	200,000	-- / --	0.0012	95.8	4.79E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	180 - 230	0 / 13	--	--	200,000	-- / --	0.0012	95.8	4.79E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-octylphthalate	180 - 230	0 / 13	--	--	100	-- / --	2.30	95.8	0.96	--	--	--	--	--	No	Not detected
Fluoranthene	180 - 230	0 / 13	--	--	1,100	-- / --	0.21	95.8	0.087	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	180 - 230	0 / 13	--	--	2.50	-- / --	92.0	95.8	38	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	180 - 230	0 / 13	--	--	NSV	-- / --	NSV	95.8	NSV	--	--	--	--	--	No	Not detected
Hexachlorocyclopentadiene	180 - 230	0 / 12	--	--	10,000	-- / --	0.023	94.6	0.009	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	180 - 230	0 / 13	--	--	100	-- / --	2.30	95.8	0.96	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	36.0 - 47.0	0 / 13	--	--	1,100	-- / --	0.043	19.2	0.017	--	--	--	--	--	No	HQ less than one, not detected
Isophorone	36.0 - 47.0	0 / 13	--	--	NSV	-- / --	NSV	19.2	NSV	--	--	--	--	--	No	Not detected
Naphthalene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	36.0 - 47.0	0 / 13	--	--	NSV	-- / --	NSV	19.2	NSV	--	--	--	--	--	No	Not detected
n-Nitrosodiphenylamine	180 - 230	0 / 13	--	--	20,000	-- / --	0.012	95.8	0.005	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	180 - 230	0 / 13	--	--	40,000	-- / --	0.0058	95.8	0.002	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	180 - 230	0 / 13	--	--	2,100	-- / --	0.11	95.8	0.046	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	180 - 230	0 / 13	--	--	29,000	-- / --	0.0079	95.8	0.003	--	--	--	--	--	No	HQ less than one, not detected
Phenol	180 - 230	0 / 13	--	--	50.0	-- / --	4.60	95.8	1.92	--	--	--	--	--	No	Not detected



Table F-10  
ERS Surface Soil Screen for Site 85  
Camp Johnson Consutrction Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Pyrene	180 - 230	0 / 13	--	--	1,100	-- / --	0.21	95.8	0.087	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	1.80 - 2.30	5 / 13	3.10	IR85-SS18-00-01-09C	21.0	0 / 13	0.15	1.11	0.053	--	--	--	--	--	No	HQ is less than one, detected
4,4'-DDE	1.90 - 1.90	12 / 13	29.0	IR85-SS18-00-01-09C	21.0	1 / 13	1.38	4.35	0.21	--	--	--	--	--	No	Low frequency and magnitude of exceedance, mean HQ less than one
4,4'-DDT	1.80 - 1.90	11 / 13	25.0	IR85-SS18-00-01-09C	21.0	1 / 13	1.19	3.76	0.18	--	--	--	--	--	No	Low frequency and magnitude of exceedance, mean HQ less than one
Aldrin	1.80 - 2.30	0 / 13	--	--	2.50	-- / --	0.92	0.96	0.38	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	1.80 - 2.30	0 / 13	--	--	2.50	-- / --	0.92	0.96	0.38	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1016	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
Aroclor-1221	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
Aroclor-1232	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
Aroclor-1242	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
Aroclor-1248	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
Aroclor-1254	17.0 - 22.0	2 / 13	50.0	IR85-SS17-00-01-09C	20.0	2 / 13	2.50	14.6	0.73	--	--	--	--	--	No	Low magnitude of exceedance, mean HQ less than one
Aroclor-1260	17.0 - 23.0	0 / 13	--	--	20.0	-- / --	1.15	9.31	0.47	--	--	--	--	--	No	Not detected
beta-BHC	1.80 - 2.30	0 / 13	--	--	1.00	-- / --	2.30	0.96	0.96	--	--	--	--	--	No	Not detected
delta-BHC	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Dieldrin	1.80 - 2.20	1 / 13	1.90	IR85-SS17-00-01-09C	4.90	0 / 13	0.39	1.02	0.21	--	--	--	--	--	No	HQ is less than one, detected
Endosulfan I	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan sulfate	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endrin	1.80 - 2.30	0 / 13	--	--	1.00	-- / --	2.30	0.96	0.96	--	--	--	--	--	No	Not detected
Endrin aldehyde	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
gamma-BHC (Lindane)	1.80 - 2.30	0 / 13	--	--	0.050	-- / --	46.0	0.96	19	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.80 - 1.90	2 / 13	2.70	IR85-SS18-00-01-09C	100	0 / 13	0.027	1.06	0.011	--	--	--	--	--	No	HQ is less than one, detected
Heptachlor	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.80 - 2.30	0 / 13	--	--	100	-- / --	0.023	0.96	0.010	--	--	--	--	--	No	HQ less than one, not detected
Toxaphene	36.0 - 47.0	0 / 13	--	--	100	-- / --	0.47	19.2	0.19	--	--	--	--	--	No	HQ less than one, not detected
Inorganics (MG/KG)																
Aluminum	-- - --	13 / 13	7,300	IR85-SS14-00-01-09C	50.0	13 / 13	146	4,508	90	5,487	Yes	--	--	--	No	Within background range
Antimony	1.50 - 38.5	1 / 13	5.90	IR85-SS18-00-01-09C	0.27	1 / 13	21.9	2.61	9.66	0.447	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Arsenic	-- - --	13 / 13	9.90	IR85-SS17-00-01-09C	18.0	0 / 13	0.55	1.83	0.102	0.626	Yes	--	--	--	No	HQ is less than one, detected
Barium	24.0 - 24.0	12 / 13	31.0	IR85-SS17-00-01-09C	330	0 / 13	0.094	12.6	0.038	14.5	Yes	--	--	--	No	HQ is less than one, detected
Beryllium	0.16 - 3.90	9 / 13	0.096	IR85-SS18-00-01-09C	21.0	0 / 13	0.0046	0.20	0.010	0.10	No	--	--	--	No	Consistent with background
Cadmium	0.45 - 0.49	3 / 13	3.50	IR85-SS18-00-01-09C	0.36	3 / 13	9.72	0.72	2.00	0.033	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Calcium <sup>2</sup>	76.4 - 1,930	8 / 13	468	IR85-SS16-00-01-09C	NSV	-- / --	NSV	237	NSV	6,360	No	--	--	--	No	Macronutrient
Chromium	38.5 - 38.5	12 / 13	8.50	IR85-SS18-00-01-09C	26.0	0 / 13	0.33	5.23	0.20	6.05	Yes	--	--	--	No	Within background range
Cobalt	0.39 - 0.41	11 / 13	2.40	IR85-SS17-00-01-09C	13.0	0 / 13	0.18	0.39	0.030	0.29	Yes	--	--	--	No	HQ is less than one, detected
Copper	-- - --	13 / 13	214	IR85-SS18-00-01-09C	28.0	2 / 13	7.64	27.6	0.99	4.83	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Iron	-- - --	13 / 13	11,500	IR85-SS18-00-01-09C	200	13 / 13	57.5	3,332	17	3,245	Yes	--	--	--	No	Within background range
Lead	-- - --	13 / 13	614	IR85-SS18-00-01-09C	11.0	6 / 13	55.8	72.3	6.57	12.3	Yes	50.0	Region 4 (EPA, 2001)	12.3	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Magnesium <sup>2</sup>	-- - --	13 / 13	178	IR85-SS14-00-01-09C	NSV	-- / --	NSV	133	NSV	238	No	--	--	--	No	Consistent with background
Manganese	-- - --	13 / 13	10,700	IR85-SS17-00-01-09C	220	4 / 13	48.6	975	4.43	13.7	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high



Table F-10  
ERS Surface Soil Screen for Site 85  
Camp Johnson Consutrclon Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Mercury	0.033 - 0.034	11 / 13	8.80	IR85-SS18-00-01-09C	0.10	5 / 13	88.0	1.21	12	0.081	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Nickel	-- - --	13 / 13	8.70	IR85-SS17-00-01-09C	38.0	0 / 13	0.23	2.11	0.06	1.21	Yes	--	--	--	No	HQ is less than one, detected
Potassium <sup>2</sup>	79.3 - 1,930	9 / 13	136	IR85-SS06-00-01-09C	NSV	-- / --	NSV	157	NSV	116	Yes	--	--	--	No	Within background range
Selenium	1.50 - 38.5	1 / 13	0.45	IR85-SS14-00-01-09C	0.52	0 / 13	0.87	2.50	4.80	0.56	No	--	--	--	No	Consistent with background
Silver	1.50 - 38.5	5 / 13	0.29	IR85-SS16-00-01-09C	4.20	0 / 13	0.069	2.28	0.54	0.14	Yes	--	--	--	No	HQ is less than one, detected
Sodium <sup>2</sup>	198 - 4,820	7 / 13	7.50	IR85-SS09-00-01-09C	NSV	-- / --	NSV	265	NSV	80.9	No	--	--	--	No	Consistent with background
Thallium	2.30 - 14.4	2 / 13	18.7	IR85-SS17-00-01-09C	1.00	1 / 13	18.7	2.95	2.95	0.36	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high
Vanadium	96.3 - 96.3	12 / 13	10.0	IR85-SS14-00-01-09C	7.80	3 / 13	1.28	10.2	1.31	8.90	Yes	--	--	--	No	Within background range
Zinc	3.90 - 4.10	11 / 13	5,600	IR85-SS17-00-01-09C	46.0	5 / 13	122	711	15	10.8	Yes	--	--	--	Yes	HQ above 1, maximum concentration well above background range, and magnitude of exceedance is high

NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
HQ - Hazard Quotient  
MG/KG - Milligrams per kilogram  
NSV - No Screening Value  
UG/KG - Micrograms per kilogram  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-11  
ERS Subsurface Soil Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethane	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,1-Dichloroethene	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.60 - 1.90	5 / 9	2.70	IR85-SB11-2-7-09C	10.0	0 / 9	0.27	1.66	0.17	--	--	--	--	--	No	HQ less than one, detected
1,2-Dibromo-3-chloropropane	1.60 - 2.10	1 / 9	2.40	IR85-SB11-2-7-09C	NSV	-- / --	NSV	1.04	NSV	--	--	35.2	Buchman, 2008	0.068	No	Supplemental HQ less than one
1,2-Dibromoethane	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.60 - 2.10	0 / 9	--	--	10.0	-- / --	0.21	0.88	0.088	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.60 - 2.10	0 / 9	--	--	400	-- / --	0.0053	0.88	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.60 - 2.10	0 / 9	--	--	700,000	-- / --	3.00E-06	0.88	1.262E-06	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.60 - 1.90	3 / 9	1.40	IR85-SB08-2-7-09C	10.0	0 / 9	0.14	1.02	0.102	--	--	--	--	--	No	HQ less than one, detected
1,4-Dichlorobenzene	1.60 - 2.10	0 / 9	--	--	10.0	-- / --	0.21	0.88	0.088	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	3.50 - 3.80	8 / 10	4.10	IR85-SB13-2-7-09C	NSV	-- / --	NSV	2.44	NSV	--	--	89,600	Buchman, 2008	9.03E-06	No	Supplemental HQ less than one, common lab contaminant
2-Hexanone	3.10 - 4.10	0 / 9	--	--	NSV	-- / --	NSV	1.77	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	3.10 - 4.10	1 / 9	1.50	IR85-SB11-2-7-09C	NSV	-- / --	NSV	1.72	NSV	--	--	443,000	Buchman, 2008	0.000	No	Supplemental HQ less than one
Acetone	3.50 - 3.80	8 / 10	100	IR85-SB13-2-7-09C	NSV	-- / --	NSV	51.6	NSV	--	--	2500	Buchman, 2008	1.41E-02	No	Supplemental HQ less than one
Benzene	1.60 - 2.10	0 / 9	--	--	50.0	-- / --	0.042	0.88	0.018	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Bromomethane	3.50 - 3.80	0 / 2	--	--	NSV	-- / --	NSV	1.83	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon disulfide	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	1.60 - 2.10	0 / 9	--	--	1,000,000	-- / --	2.10E-06	0.88	8.833E-07	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.60 - 2.10	0 / 9	--	--	50.0	-- / --	0.042	0.88	0.018	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	3.10 - 4.10	0 / 8	--	--	100	-- / --	0.041	1.78	0.018	--	--	--	--	--	No	HQ less than one, not detected
Chloroform	1.60 - 2.10	1 / 9	1.00	IR85-SB11-2-7-09C	1.00	1 / 9	1.00	0.89	0.89	--	--	--	--	--	No	Low magnitude of exceedance, mean HQ less than one, common lab contaminant.
Chloromethane	3.10 - 4.10	0 / 9	--	--	NSV	-- / --	NSV	1.77	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,2-Dichloroethene	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Cyclohexane	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
Dibromochloromethane	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Ethylbenzene	1.60 - 2.10	0 / 9	--	--	50.0	-- / --	0.042	0.88	0.018	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.70 - 1.90	5 / 9	2.70	IR85-SB08-2-7-09C	NSV	-- / --	NSV	1.68	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methyl acetate	1.60 - 1.90	6 / 10	20.0	IR85-SB07-2-4-09C	NSV	-- / --	NSV	3.91	NSV	--	--	--	--	--	No	Uncertainty, no screening value
Methylcyclohexane	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	3.10 - 3.30	8 / 10	2.30	IR85-SB08-2-7-09C	2,000	0 / 10	0.0012	1.51	0.001	--	--	--	--	--	No	HQ less than one, detected
Methyl-tert-butyl ether (MTBE)	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.70 - 3.30	6 / 9	2.80	IR85-SB08-2-7-09C	100	0 / 9	0.028	2.01	0.020	--	--	--	--	--	No	HQ less than one, detected
Tetrachloroethene	1.60 - 1.90	4 / 9	1.60	IR85-SB08-2-7-09C	10.0	0 / 9	0.16	1.13	0.11	--	--	--	--	--	No	HQ less than one, detected
Toluene	1.60 - 2.10	1 / 9	0.64	IR85-SB17-6-7-09C	50.0	0 / 9	0.013	0.85	0.017	--	--	--	--	--	No	HQ less than one, detected
trans-1,2-Dichloroethene	1.60 - 2.10	0 / 9	--	--	100	-- / --	0.021	0.88	0.009	--	--	--	--	--	No	HQ less than one, not detected
trans-1,3-Dichloropropene	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Trichloroethene	1.60 - 2.10	0 / 9	--	--	1.00	-- / --	2.10	0.88	0.883	--	--	--	--	--	No	Not detected
Trichlorofluoromethane(Freon-11)	1.60 - 2.10	0 / 9	--	--	NSV	-- / --	NSV	0.88	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	3.30 - 3.80	0 / 3	--	--	10.0	-- / --	0.38	1.77	0.18	--	--	--	--	--	No	HQ less than one, not detected
Xylene, total	1.60 - 3.30	0 / 9	--	--	50.0	-- / --	0.066	0.97	0.019	--	--	--	--	--	No	HQ less than one, not detected
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	180 - 200	0 / 10	--	--	60,000	-- / --	0.0033	94.5	0.002	--	--	--	--	--	No	HQ less than one, not detected



Table F-11  
ERS Subsurface Soil Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
2,2'-Oxybis(1-chloropropane)	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	180 - 200	0 / 10	--	--	4,000	-- / --	0.050	94.5	0.024	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dichlorophenol	180 - 200	0 / 10	--	--	3.00	-- / --	66.7	94.5	32	--	--	--	--	--	No	Not detected
2,4-Dimethylphenol	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	180 - 200	0 / 10	--	--	20,000	-- / --	0.010	94.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	180 - 200	0 / 10	--	--	1,000	-- / --	0.20	94.5	0.095	--	--	--	--	--	No	HQ less than one, not detected
2-Chlorophenol	180 - 200	0 / 10	--	--	10.0	-- / --	20.0	94.5	9.45	--	--	--	--	--	No	Not detected
2-Methylnaphthalene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
2-Methylphenol	180 - 200	0 / 10	--	--	500	-- / --	0.40	94.5	0.19	--	--	--	--	--	No	HQ less than one, not detected
2-Nitroaniline	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	180 - 200	0 / 10	--	--	20,000	-- / --	0.010	94.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
4-Chlorophenyl-phenylether	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	180 - 200	0 / 10	--	--	500	-- / --	0.40	94.5	0.19	--	--	--	--	--	No	HQ less than one, not detected
4-Nitroaniline	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	180 - 200	0 / 10	--	--	7,000	-- / --	0.029	94.5	0.014	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthylene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Acetophenone	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Atrazine	180 - 200	0 / 10	--	--	0.050	-- / --	4,000	94.5	1890	--	--	--	--	--	No	Not detected
Benzo(a)anthracene	36.0 - 39.0	0 / 10	--	--	1,100	-- / --	0.035	18.7	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(a)pyrene	36.0 - 39.0	0 / 10	--	--	1,100	-- / --	0.035	18.7	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(b)fluoranthene	36.0 - 39.0	0 / 10	--	--	1,100	-- / --	0.035	18.7	0.017	--	--	--	--	--	No	HQ less than one, not detected
Benzo(g,h,i)perylene	180 - 200	0 / 10	--	--	1,100	-- / --	0.18	94.5	0.086	--	--	--	--	--	No	HQ less than one, not detected
Benzo(k)fluoranthene	180 - 200	0 / 10	--	--	1,100	-- / --	0.18	94.5	0.086	--	--	--	--	--	No	HQ less than one, not detected
bis(2-Chloroethoxy)methane	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	180 - 200	1 / 10	58.0	IR85-SB14-2-7-09C	100	0 / 10	0.58	90.8	0.91	--	--	--	--	--	No	HQ less than one, detected
Butylbenzylphthalate	180 - 200	0 / 10	--	--	100	-- / --	2.00	94.5	0.95	--	--	--	--	--	No	Not detected
Caprolactam	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	180 - 200	0 / 10	--	--	1,100	-- / --	0.18	94.5	0.086	--	--	--	--	--	No	HQ less than one, not detected
Dibenz(a,h)anthracene	36.0 - 39.0	0 / 10	--	--	1,100	-- / --	0.035	18.7	0.017	--	--	--	--	--	No	HQ less than one, not detected
Dibenzofuran	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	180 - 200	0 / 10	--	--	100,000	-- / --	0.0020	94.5	0.001	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	180 - 200	0 / 10	--	--	200,000	-- / --	0.0010	94.5	4.725E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	180 - 200	0 / 10	--	--	200,000	-- / --	0.0010	94.5	4.725E-04	--	--	--	--	--	No	HQ less than one, not detected
Di-n-octylphthalate	180 - 200	0 / 10	--	--	100	-- / --	2.00	94.5	0.95	--	--	--	--	--	No	Not detected
Fluoranthene	180 - 200	0 / 10	--	--	1,100	-- / --	0.18	94.5	0.086	--	--	--	--	--	No	HQ less than one, not detected
Fluorene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Hexachlorobenzene	180 - 200	0 / 10	--	--	2.50	-- / --	80.0	94.5	38	--	--	--	--	--	No	Not detected
Hexachlorobutadiene	180 - 200	0 / 10	--	--	NSV	-- / --	NSV	94.5	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorocyclopentadiene	180 - 200	0 / 10	--	--	10,000	-- / --	0.020	94.5	0.009	--	--	--	--	--	No	HQ less than one, not detected
Hexachloroethane	180 - 200	0 / 10	--	--	100	-- / --	2.00	94.5	0.95	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	36.0 - 39.0	0 / 10	--	--	1,100	-- / --	0.035	18.7	0.017	--	--	--	--	--	No	HQ less than one, not detected
Isophorone	36.0 - 39.0	0 / 10	--	--	NSV	-- / --	NSV	18.7	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-11  
ERS Subsurface Soil Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Naphthalene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	36.0 - 39.0	0 / 10	--	--	NSV	-- / --	NSV	18.7	NSV	--	--	--	--	--	No	No screening value, not detected
n-Nitrosodiphenylamine	180 - 200	0 / 10	--	--	20,000	-- / --	0.010	94.5	0.005	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	180 - 200	0 / 10	--	--	40,000	-- / --	0.0050	94.5	0.002	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	180 - 200	0 / 10	--	--	2,100	-- / --	0.095	94.5	0.045	--	--	--	--	--	No	HQ less than one, not detected
Phenanthrene	180 - 200	0 / 10	--	--	29,000	-- / --	0.0069	94.5	0.003	--	--	--	--	--	No	HQ less than one, not detected
Phenol	180 - 200	0 / 10	--	--	50.0	-- / --	4.00	94.5	1.89	--	--	--	--	--	No	Not detected
Pyrene	180 - 200	0 / 10	--	--	1,100	-- / --	0.18	94.5	0.086	--	--	--	--	--	No	HQ less than one, not detected
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	1.70 - 2.00	2 / 10	1.90	IR85-SB09-2-7-09C	21.0	0 / 10	0.090	1.07	0.051	--	--	--	--	--	No	HQ less than one, detected
4,4'-DDE	1.70 - 2.00	2 / 10	31.0	IR85-SB07-2-4-09C	21.0	1 / 10	1.48	4.04	0.19	--	--	--	--	--	No	Low magnitude of exceedance, mean HQ less than one
4,4'-DDT	1.70 - 2.00	2 / 10	10.0	IR85-SB07-2-4-09C	21.0	0 / 10	0.48	1.87	0.089	--	--	--	--	--	No	HQ less than one, detected
Aldrin	1.70 - 2.00	0 / 10	--	--	2.50	-- / --	0.80	0.93	0.37	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	1.70 - 2.00	0 / 10	--	--	2.50	-- / --	0.80	0.93	0.37	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1016	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1221	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1232	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1242	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1248	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1254	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
Aroclor-1260	17.0 - 19.0	0 / 10	--	--	20.0	-- / --	0.95	9.00	0.45	--	--	--	--	--	No	HQ less than one, not detected
beta-BHC	1.70 - 2.00	0 / 10	--	--	1.00	-- / --	2.00	0.93	0.93	--	--	--	--	--	No	Not detected
delta-BHC	1.70 - 2.00	1 / 10	1.10	IR85-SB13-2-7-09C	100	0 / 10	0.011	0.94	0.009	--	--	--	--	--	No	HQ less than one, detected
Dieldrin	1.70 - 2.00	0 / 10	--	--	4.90	-- / --	0.41	0.93	0.19	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan I	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan II	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endosulfan sulfate	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endrin	1.70 - 2.00	0 / 10	--	--	1.00	-- / --	2.00	0.93	0.93	--	--	--	--	--	No	Not detected
Endrin aldehyde	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Endrin ketone	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
gamma-BHC (Lindane)	1.70 - 2.00	0 / 10	--	--	0.050	-- / --	40.0	0.93	19	--	--	--	--	--	No	Not detected
gamma-Chlordane	1.70 - 2.00	1 / 10	1.90	IR85-SB13-2-7-09C	100	0 / 10	0.019	1.02	0.010	--	--	--	--	--	No	HQ less than one, detected
Heptachlor	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Heptachlor epoxide	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Methoxychlor	1.70 - 2.00	0 / 10	--	--	100	-- / --	0.020	0.93	0.009	--	--	--	--	--	No	HQ less than one, not detected
Toxaphene	33.0 - 39.0	0 / 10	--	--	100	-- / --	0.39	18.2	0.18	--	--	--	--	--	No	HQ less than one, not detected
Inorganics (MG/KG)																
Aluminum	-- - --	10 / 10	12,000	IR85-SB09-2-7-09C	50.0	10 / 10	240	5,855	117	10,369	Yes	--	--	--	No	Within background range
Antimony	1.60 - 1.70	0 / 10	--	--	0.27	-- / --	6.30	0.81	2.98	0.36	Yes	--	--	--	No	Not detected
Arsenic	-- - --	10 / 10	2.30	IR85-SB07-2-4-09C	18.0	0 / 10	0.13	1.32	0.073	2.12	Yes	--	--	--	No	Within background range
Barium	-- - --	10 / 10	16.2	IR85-SB09-2-7-09C	330	0 / 10	0.049	8.40	0.025	16.6	No	--	--	--	No	Consistent with background
Beryllium	0.16 - 0.17	4 / 10	0.072	IR85-SB09-2-7-09C	21.0	0 / 10	0.0034	0.065	0.003	0.17	No	--	--	--	No	Consistent with background
Cadmium	0.47 - 0.50	0 / 10	--	--	0.36	-- / --	1.39	0.24	0.67	0.023	--	--	--	--	No	Not detected
Calcium <sup>2</sup>	78.2 - 83.0	2 / 10	84.8	IR85-SB09-2-7-09C	NSV	-- / --	NSV	42.2	NSV	441	No	--	--	--	No	Consistent with background
Chromium	-- - --	10 / 10	12.5	IR85-SB09-2-7-09C	26.0	0 / 10	0.48	6.30	0.24	14.5	No	--	--	--	No	Consistent with background
Cobalt	0.39 - 0.42	4 / 10	0.72	IR85-SB09-2-7-09C	13.0	0 / 10	0.055	0.26	0.020	0.822	No	--	--	--	No	Consistent with background
Copper	-- - --	10 / 10	1.70	IR85-SB17-6-7-09C	28.0	0 / 10	0.061	1.06	0.038	2.56	No	--	--	--	No	Consistent with background
Iron	-- - --	10 / 10	5,040	IR85-SB09-2-7-09C	200	10 / 10	25.2	3,351	17	5,439	No	--	--	--	No	Consistent with background
Lead	-- - --	10 / 10	7.70	IR85-SB09-2-7-09C	11.0	0 / 10	0.70	4.48	0.41	8.49	No	--	--	--	No	Consistent with background
Magnesium <sup>2</sup>	-- - --	10 / 10	424	IR85-SB09-2-7-09C	NSV	-- / --	NSV	198	NSV	363	Yes	--	--	--	No	Macronutrient
Manganese	-- - --	10 / 10	31.2	IR85-SB08-2-7-09C	220	0 / 10	0.14	9.60	0.044	9.25	Yes	--	--	--	No	Within background range



Table F-11  
ERS Subsurface Soil Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance <sup>1</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Hazard Quotient	Retain?	Rationale
Mercury	0.033 - 0.037	2 / 10	0.17	IR85-SB06-2-7-09C	0.10	1 / 10	1.70	0.034	0.34	0.071	Yes	--	--	--	No	Low frequency and magnitude of exceedance, barely exceeds maximum background value
Nickel	0.83 - 0.83	9 / 10	2.40	IR85-SB09-2-7-09C	38.0	0 / 10	0.063	1.11	0.029	2.27	Yes	--	--	--	No	Within background range
Potassium <sup>2</sup>	-- - --	10 / 10	306	IR85-SB09-2-7-09C	NSV	-- / --	NSV	152	NSV	361	No	--	--	--	No	Consistent with background
Selenium	1.60 - 1.70	1 / 10	0.47	IR85-SB09-2-7-09C	0.52	0 / 10	0.90	0.77	1.48	0.505	No	--	--	--	No	Consistent with background
Silver	1.60 - 1.60	3 / 10	0.17	IR85-SB14-2-7-09C	4.20	0 / 10	0.040	0.59	0.14	0.13	Yes	--	--	--	No	Within background range
Sodium <sup>2</sup>	199 - 199	9 / 10	23.1	IR85-SB09-2-7-09C	NSV	-- / --	NSV	17.9	NSV	68	No	--	--	--	No	Consistent with background
Thallium	2.30 - 2.50	0 / 10	--	--	1.00	-- / --	2.50	1.20	1.20	0.38	--	--	--	--	No	Not detected
Vanadium	-- - --	10 / 10	16.4	IR85-SB09-2-7-09C	7.80	7 / 10	2.10	9.68	1.24	17.2	No	--	--	--	No	Consistent with background
Zinc	4.00 - 4.00	6 / 10	52.9	IR85-SB17-6-7-09C	46.0	2 / 10	1.15	16.0	0.35	6.59	Yes	--	--	--	No	Low magnitude of exceedance, mean HQ less than one

NOTES  
1 - Count of detected samples exceeding or equaling Screening Value  
2 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
HQ - Hazard Quotient  
MG/KG - Milligrams per kilogram  
NSV - No Screening Value  
UG/KG - Micrograms per kilogram  
Generated by: Sara Kent  
Checked by: Kelly Taylor



Table F-12

ERS Groundwater Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Volatile Organic Compounds (UG/L)																
1,1,1-Trichloroethane	1.00 - 1.00	0 / 9	--	--	312	-- / --	0.0032	0.50	0.002	--	--	--	--	--	No	HQ less than one, not detected
1,1,2,2-Tetrachloroethane	1.00 - 2.40	0 / 9	--	--	90.2	-- / --	0.027	0.73	0.008	--	--	--	--	--	No	HQ less than one, not detected
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1,2-Trichloroethane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,1-Dichloroethene	1.00 - 1.00	0 / 9	--	--	2,240	-- / --	4.46E-04	0.50	2.232E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2,4-Trichlorobenzene	1.00 - 1.00	0 / 9	--	--	4.50	-- / --	0.22	0.50	0.11	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dibromo-3-chloropropane	2.00 - 2.00	0 / 6	--	--	NSV	-- / --	NSV	1.00	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dibromoethane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
1,2-Dichlorobenzene	1.00 - 1.00	0 / 9	--	--	19.7	-- / --	0.051	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloroethane	1.00 - 1.00	0 / 9	--	--	1,130	-- / --	8.85E-04	0.50	4.425E-04	--	--	--	--	--	No	HQ less than one, not detected
1,2-Dichloropropane	1.00 - 1.00	0 / 9	--	--	2,400	-- / --	4.17E-04	0.50	2.083E-04	--	--	--	--	--	No	HQ less than one, not detected
1,3-Dichlorobenzene	1.00 - 1.00	0 / 9	--	--	28.5	-- / --	0.035	0.50	0.018	--	--	--	--	--	No	HQ less than one, not detected
1,4-Dichlorobenzene	1.00 - 1.00	0 / 9	--	--	19.9	-- / --	0.050	0.50	0.025	--	--	--	--	--	No	HQ less than one, not detected
2-Butanone	5.00 - 5.00	0 / 9	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
2-Hexanone	5.00 - 5.00	0 / 9	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methyl-2-pentanone	5.00 - 5.00	0 / 9	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Acetone	5.00 - 5.00	0 / 9	--	--	NSV	-- / --	NSV	2.50	NSV	--	--	--	--	--	No	No screening value, not detected
Benzene	1.00 - 1.00	0 / 9	--	--	109	-- / --	0.0092	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Bromodichloromethane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Bromoform	1.00 - 1.00	0 / 9	--	--	640	-- / --	0.0016	0.50	0.001	--	--	--	--	--	No	HQ less than one, not detected
Bromomethane	1.00 - 1.10	0 / 8	--	--	120	-- / --	0.0092	0.52	0.004	--	--	--	--	--	No	HQ less than one, not detected
Carbon disulfide	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Carbon tetrachloride	1.00 - 1.00	0 / 9	--	--	1,500	-- / --	6.67E-04	0.50	3.333E-04	--	--	--	--	--	No	HQ less than one, not detected
Chlorobenzene	1.00 - 1.00	0 / 9	--	--	105	-- / --	0.0095	0.50	0.005	--	--	--	--	--	No	HQ less than one, not detected
Chloroethane	1.00 - 1.00	0 / 8	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Chloroform	1.00 - 2.20	2 / 9	11.0	IR85-MW05-09C	815	0 / 9	0.013	2.37	0.003	--	--	--	--	--	No	HQ less than one, detected
Chloromethane	1.00 - 1.00	0 / 9	--	--	2,700	-- / --	3.70E-04	0.50	1.852E-04	--	--	--	--	--	No	HQ less than one, not detected
cis-1,2-Dichloroethene	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
cis-1,3-Dichloropropene	1.00 - 1.00	0 / 9	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Cyclohexane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dibromochloromethane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Dichlorodifluoromethane (Freon-12)	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	Not detected, no screening value
Ethylbenzene	1.00 - 1.00	0 / 9	--	--	4.30	-- / --	0.23	0.50	0.12	--	--	--	--	--	No	HQ less than one, not detected
Isopropylbenzene	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methyl acetate	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylcyclohexane	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Methylene chloride	1.00 - 1.00	2 / 9	190	IR85-TW06-09C	2,560	0 / 9	0.074	23.1	0.009	--	--	--	--	--	No	HQ less than one, detected
Methyl-tert-butyl ether (MTBE)	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Styrene	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Tetrachloroethene	1.00 - 1.10	0 / 9	--	--	45.0	-- / --	0.024	0.52	0.012	--	--	--	--	--	No	HQ less than one, not detected
Toluene	1.00 - 1.00	0 / 9	--	--	37.0	-- / --	0.027	0.50	0.014	--	--	--	--	--	No	HQ less than one, not detected
trans-1,2-Dichloroethene	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
trans-1,3-Dichloropropene	1.00 - 1.00	0 / 9	--	--	7.90	-- / --	0.13	0.50	0.063	--	--	--	--	--	No	HQ less than one, not detected
Trichloroethene	1.00 - 5.10	0 / 9	--	--	NSV	-- / --	NSV	1.41	NSV	--	--	--	--	--	No	No screening value, not detected
Trichlorofluoromethane(Freon-11)	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Vinyl chloride	1.00 - 1.00	0 / 9	--	--	NSV	-- / --	NSV	0.50	NSV	--	--	--	--	--	No	No screening value, not detected
Xylene, total	1.00 - 1.20	0 / 9	--	--	NSV	-- / --	NSV	0.54	NSV	--	--	--	--	--	No	No screening value, not detected
Semivolatile Organic Compounds (UG/L)																
1,1-Biphenyl	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2,2'-Oxybis(1-chloropropane)	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2,4,5-Trichlorophenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dichlorophenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-12

ERS Groundwater Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
2,4-Dimethylphenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2,4-Dinitrophenol	20.0 - 21.0	0 / 9	--	--	48.5	-- / --	0.43	10.2	0.21	--	--	--	--	--	No	HQ less than one, not detected
2,4-Dinitrotoluene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2,6-Dinitrotoluene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chloronaphthalene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Chlorophenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylnaphthalene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Methylphenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitroaniline	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
2-Nitrophenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
3,3'-Dichlorobenzidine	20.0 - 21.0	0 / 9	--	--	NSV	-- / --	NSV	10.2	NSV	--	--	--	--	--	No	No screening value, not detected
3-Nitroaniline	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4,6-Dinitro-2-methylphenol	20.0 - 21.0	0 / 9	--	--	NSV	-- / --	NSV	10.2	NSV	--	--	--	--	--	No	No screening value, not detected
4-Bromophenyl-phenylether	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloro-3-methylphenol	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chloroaniline	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4-Chlorophenyl-phenylether	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4-Methylphenol	20.0 - 21.0	0 / 9	--	--	NSV	-- / --	NSV	10.2	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitroaniline	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
4-Nitrophenol	20.0 - 21.0	0 / 9	--	--	71.7	-- / --	0.29	10.2	0.14	--	--	--	--	--	No	HQ less than one, not detected
Acenaphthene	10.0 - 11.0	0 / 9	--	--	9.70	-- / --	1.13	5.06	0.52	--	--	--	--	--	No	Not detected
Acenaphthylene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Acetophenone	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Anthracene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Atrazine	20.0 - 21.0	0 / 9	--	--	NSV	-- / --	NSV	10.2	NSV	--	--	--	--	--	No	No screening value, not detected
Benzaldehyde	10.0 - 10.0	0 / 4	--	--	NSV	-- / --	NSV	5.00	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)anthracene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(a)pyrene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(b)fluoranthene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(g,h,i)perylene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Benzo(k)fluoranthene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethoxy)methane	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Chloroethyl)ether	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
bis(2-Ethylhexyl)phthalate	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Butylbenzylphthalate	10.0 - 11.0	0 / 9	--	--	29.4	-- / --	0.37	5.06	0.17	--	--	--	--	--	No	Not detected, HQ less than one
Caprolactam	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Carbazole	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Chrysene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenz(a,h)anthracene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Dibenzofuran	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Diethylphthalate	10.0 - 11.0	0 / 9	--	--	759	-- / --	0.014	5.06	0.007	--	--	--	--	--	No	HQ less than one, not detected
Dimethyl phthalate	10.0 - 11.0	0 / 9	--	--	580	-- / --	0.019	5.06	0.009	--	--	--	--	--	No	HQ less than one, not detected
Di-n-butylphthalate	20.0 - 21.0	0 / 9	--	--	3.40	-- / --	6.18	10.2	2.99	--	--	--	--	--	No	Not detected
Di-n-octylphthalate	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Fluoranthene	10.0 - 11.0	0 / 9	--	--	1.60	-- / --	6.88	5.06	3.16	--	--	--	--	--	No	Not detected
Fluorene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobenzene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Hexachlorobutadiene	10.0 - 11.0	0 / 9	--	--	0.32	-- / --	34.4	5.06	16	--	--	--	--	--	No	Not detected
Hexachlorocyclopentadiene	10.0 - 11.0	0 / 9	--	--	0.070	-- / --	157	5.06	72	--	--	--	--	--	No	Not detected
Hexachloroethane	10.0 - 11.0	0 / 9	--	--	9.40	-- / --	1.17	5.06	0.54	--	--	--	--	--	No	Not detected
Indeno(1,2,3-cd)pyrene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Isophorone	10.0 - 11.0	0 / 9	--	--	129	-- / --	0.085	5.06	0.039	--	--	--	--	--	No	HQ less than one, not detected
Naphthalene	10.0 - 11.0	0 / 9	--	--	23.5	-- / --	0.47	5.06	0.22	--	--	--	--	--	No	HQ less than one, not detected
n-Nitroso-di-n-propylamine	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected



Table F-12

ERS Groundwater Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
n-Nitrosodiphenylamine	10.0 - 11.0	0 / 9	--	--	33,000	-- / --	3.33E-04	5.06	1.532E-04	--	--	--	--	--	No	HQ less than one, not detected
Nitrobenzene	10.0 - 11.0	0 / 9	--	--	30.0	-- / --	0.37	5.06	0.17	--	--	--	--	--	No	HQ less than one, not detected
Pentachlorophenol	20.0 - 21.0	0 / 9	--	--	7.90	-- / --	2.66	10.2	1.29	--	--	--	--	--	No	Not detected
Phenanthrene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Phenol	10.0 - 11.0	0 / 9	--	--	58.0	-- / --	0.19	5.06	0.087	--	--	--	--	--	No	HQ less than one, not detected
Pyrene	10.0 - 11.0	0 / 9	--	--	NSV	-- / --	NSV	5.06	NSV	--	--	--	--	--	No	No screening value, not detected
Pesticide/Polychlorinated Biphenyls (UG/L)																
4,4'-DDD	0.050 - 0.078	1 / 9	0.079	IR85-TW06-09C	0.025	1 / 9	3.16	0.033	1.31	--	--	--	--	--	No	Low magnitude of exceedance and frequency of detection
4,4'-DDE	0.050 - 0.078	0 / 9	--	--	0.14	-- / --	0.56	0.027	0.19	--	--	--	--	--	No	HQ less than one, not detected
4,4'-DDT	0.050 - 0.078	0 / 9	--	--	0.0010	-- / --	78.0	0.027	27	--	--	--	--	--	No	Not detected
Aldrin	0.050 - 0.078	0 / 9	--	--	0.13	-- / --	0.60	0.027	0.21	--	--	--	--	--	No	HQ less than one, not detected
alpha-BHC	0.050 - 0.078	0 / 9	--	--	1,400	-- / --	5.57E-05	0.027	1.909E-05	--	--	--	--	--	No	HQ less than one, not detected
alpha-Chlordane	0.050 - 0.078	0 / 9	--	--	0.0040	-- / --	19.5	0.027	6.68	--	--	--	--	--	No	Not detected
Aroclor-1016	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1221	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1232	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1242	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1248	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1254	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
Aroclor-1260	0.50 - 0.78	0 / 9	--	--	0.030	-- / --	26.0	0.27	8.94	--	--	--	--	--	No	Not detected
beta-BHC	0.050 - 0.078	0 / 9	--	--	NSV	-- / --	NSV	0.027	NSV	--	--	--	--	--	No	No screening value, not detected
delta-BHC	0.050 - 0.078	0 / 9	--	--	NSV	-- / --	NSV	0.027	NSV	--	--	--	--	--	No	No screening value, not detected
Dieldrin	0.050 - 0.078	0 / 9	--	--	0.0019	-- / --	41.1	0.027	14	--	--	--	--	--	No	Not detected
Endosulfan I	0.050 - 0.078	0 / 9	--	--	0.0087	-- / --	8.97	0.027	3.07	--	--	--	--	--	No	Not detected
Endosulfan II	0.050 - 0.078	0 / 9	--	--	0.0087	-- / --	8.97	0.027	3.07	--	--	--	--	--	No	Not detected
Endosulfan sulfate	0.050 - 0.078	0 / 9	--	--	NSV	-- / --	NSV	0.027	NSV	--	--	--	--	--	No	No screening value, not detected
Endrin	0.050 - 0.078	0 / 9	--	--	0.0023	-- / --	33.9	0.027	12	--	--	--	--	--	No	Not detected
Endrin aldehyde	0.050 - 0.078	0 / 9	--	--	NSV	-- / --	NSV	0.027	NSV	--	--	--	--	--	No	No screening value, not detected
Endrin ketone	0.050 - 0.078	0 / 9	--	--	NSV	-- / --	NSV	0.027	NSV	--	--	--	--	--	No	No screening value, not detected
gamma-BHC (Lindane)	0.050 - 0.078	0 / 9	--	--	0.016	-- / --	4.88	0.027	1.67	--	--	--	--	--	No	Not detected
gamma-Chlordane	0.050 - 0.078	0 / 9	--	--	0.0040	-- / --	19.5	0.027	6.68	--	--	--	--	--	No	Not detected
Heptachlor	0.050 - 0.078	0 / 9	--	--	0.0036	-- / --	21.7	0.027	7.42	--	--	--	--	--	No	Not detected
Heptachlor epoxide	0.050 - 0.078	0 / 9	--	--	0.0036	-- / --	21.7	0.027	7.42	--	--	--	--	--	No	Not detected
Methoxychlor	0.050 - 0.078	0 / 9	--	--	0.030	-- / --	2.60	0.027	0.89	--	--	--	--	--	No	Not detected
Toxaphene	1.00 - 1.60	0 / 9	--	--	0.0020	-- / --	800	0.53	267	--	--	--	--	--	No	Not detected
Inorganics (UG/L)																
Aluminum	-- - --	9 / 9	15,100	IR85-TW06-09C	NSV	-- / --	NSV	2,054	NSV	1886	Yes	--	--	--	No	Dissolved data are consistent with background
Antimony	20.0 - 40.0	0 / 9	--	--	160	-- / --	0.25	11.1	0.069	3.28	--	--	--	--	No	HQ less than one, not detected
Arsenic	20.0 - 20.0	1 / 9	2.00	IR85-MW02-09C	36.0	0 / 9	0.056	9.11	0.25	5.77	No	--	--	--	No	Consistent with background
Barium	50.0 - 50.0	5 / 9	56.9	IR85-MW02-09C	NSV	-- / --	NSV	33.2	NSV	86.2	No	--	--	--	No	Consistent with background
Beryllium	2.00 - 2.00	5 / 9	0.27	IR85-MW02-09C	NSV	-- / --	NSV	0.53	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium	6.00 - 6.00	3 / 9	0.28	IR85-TW08-09C	8.80	0 / 9	0.032	2.06	0.23	0.358	No	--	--	--	No	Consistent with background
Calcium <sup>3</sup>	-- - --	9 / 9	3,190	IR85-TW06-09C	NSV	-- / --	NSV	1,444	NSV	69078	No	--	--	--	No	Consistent with background
Chromium	20.0 - 20.0	2 / 9	18.9	IR85-TW06-09C	50.0	0 / 9	0.38	10.1	0.20	3.13	Yes	--	--	--	No	Within background range
Cobalt	5.00 - 5.00	5 / 9	1.20	IR85-TW05-09C	NSV	-- / --	NSV	1.58	NSV	3.4	No	--	--	--	No	Consistent with background
Copper	20.0 - 40.0	5 / 9	6.80	IR85-TW06-09C	3.10	3 / 9	2.19	7.92	2.56	2.76	Yes	--	--	--	No	Consistent with background in subsurface soils
Iron	-- - --	9 / 9	6,900	IR85-TW06-09C	NSV	-- / --	NSV	2,016	NSV	5999	Yes	--	--	--	No	Within background range
Lead	20.0 - 40.0	3 / 9	15.9	IR85-TW06-09C	8.10	1 / 9	1.96	10.2	1.26	2.8	Yes	--	--	--	No	Consistent with background in subsurface soils
Magnesium <sup>3</sup>	-- - --	9 / 9	2,510	IR85-TW05-09C	NSV	-- / --	NSV	1,503	NSV	6363	No	--	--	--	No	Consistent with background
Manganese	-- - --	9 / 9	72.5	IR85-TW05-09C	NSV	-- / --	NSV	28.7	NSV	214	No	--	--	--	No	Consistent with background



Table F-12  
ERS Groundwater Screen for Site 85  
Camp Johnson Consutrcion Area  
Focused PA/SI  
MCB Camp Lejeune, North Carolina

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value <sup>1</sup>	Frequency of Exceedance <sup>2</sup>	Maximum Hazard Quotient	Arithmetic Mean Concentration	Mean Hazard Quotient	2 x Mean Background	Maximum Exceeds 2 x Mean Background?	Supplemental Screening Value	Supplemental Screening Value Source	Supplemental Screening Value Maximum HQ	Retain?	Rationale
Mercury	0.20 - 0.20	2 / 9	0.085	IR85-MW02-09C	0.94	0 / 9	0.090	0.091	0.097	0.1	No	--	--	--	No	Consistent with background
Nickel	10.0 - 10.0	7 / 9	19.7	IR85-TW05-09C	8.20	2 / 9	2.40	6.11	0.75	7.97	Yes	--	--	--	No	Within background range in subsurface soils
Potassium <sup>3</sup>	-- - --	9 / 9	2,180	IR85-MW02-09C	NSV	-- / --	NSV	873	NSV	3277	No	--	--	--	No	Consistent with background
Selenium	20.0 - 20.0	1 / 9	4.30	IR85-TW05-09C	71.0	0 / 9	0.061	9.37	0.13	3.14	Yes	--	--	--	No	Consistent with background in subsurface soils
Silver	20.0 - 20.0	1 / 9	1.50	IR85-TW04-09C	0.23	1 / 9	6.52	9.06	39	0.77	Yes	--	--	--	No	Within background range in subsurface soils
Sodium <sup>3</sup>	-- - --	9 / 9	26,800	IR85-TW06-09C	NSV	-- / --	NSV	9,110	NSV	22508	Yes	--	--	--	No	Macronutrient
Thallium	30.0 - 30.0	0 / 9	--	--	21.3	-- / --	1.41	15.0	0.70	3.78	--	--	--	--	No	Not detected
Vanadium	50.0 - 100	0 / 9	--	--	NSV	-- / --	NSV	27.8	NSV	4.72	--	--	--	--	No	No screening value, not detected
Zinc	50.0 - 50.0	7 / 9	110	IR85-TW08-09C	81.0	1 / 9	1.36	31.8	0.39	42.1	Yes	--	--	--	No	Within background range
Dissolved Inorganics (UG/L)																
Aluminum, Dissolved	1,000 - 1,000	3 / 5	106	IR85-TW07-09C	NSV	-- / --	NSV	248	NSV	1886	No	--	--	--	No	Consistent with background
Antimony, Dissolved	20.0 - 20.0	0 / 5	--	--	160	-- / --	0.13	10.0	0.063	3.28	--	--	--	--	No	HQ less than one, not detected
Arsenic, Dissolved	20.0 - 20.0	0 / 5	--	--	36.0	-- / --	0.56	10.0	0.28	5.77	--	--	--	--	No	HQ less than one, not detected
Barium, Dissolved	50.0 - 50.0	2 / 5	41.5	IR85-TW05-09C	NSV	-- / --	NSV	28.0	NSV	86.2	No	--	--	--	No	Consistent with background
Beryllium, Dissolved	2.00 - 2.00	1 / 5	0.13	IR85-TW05-09C	NSV	-- / --	NSV	0.83	NSV	0.308	No	--	--	--	No	Consistent with background
Cadmium, Dissolved	6.00 - 6.00	0 / 5	--	--	8.80	-- / --	0.68	3.00	0.34	0.358	--	--	--	--	No	HQ less than one, not detected
Calcium, Dissolved <sup>3</sup>	1,000 - 1,000	3 / 5	2,130	IR85-TW07-09C	NSV	-- / --	NSV	971	NSV	69078	No	--	--	--	No	Consistent with background
Chromium, Dissolved	20.0 - 20.0	1 / 5	1.40	IR85-TW07-09C	50.0	0 / 5	0.028	8.28	0.17	3.13	No	--	--	--	No	Consistent with background
Cobalt, Dissolved	5.00 - 5.00	3 / 5	1.10	IR85-TW05-09C	NSV	-- / --	NSV	1.54	NSV	3.4	No	--	--	--	No	Consistent with background
Copper, Dissolved	20.0 - 20.0	3 / 5	5.20	IR85-TW07-09C	3.10	1 / 5	1.68	6.00	1.94	2.76	Yes	--	--	--	No	Consistent with background in subsurface soils
Iron, Dissolved	150 - 150	4 / 5	6,090	IR85-TW05-09C	NSV	-- / --	NSV	1,558	NSV	5999	Yes	--	--	--	No	Within background range
Lead, Dissolved	20.0 - 20.0	0 / 5	--	--	8.10	-- / --	2.47	10.0	1.23	2.8	--	--	--	--	No	Not detected
Magnesium, Dissolved <sup>3</sup>	250 - 250	4 / 5	2,460	IR85-TW05-09C	NSV	-- / --	NSV	936	NSV	6363	No	--	--	--	No	Consistent with background
Manganese, Dissolved	-- - --	5 / 5	70.1	IR85-TW05-09C	NSV	-- / --	NSV	25.1	NSV	214	No	--	--	--	No	Consistent with background
Mercury, Dissolved	0.20 - 0.20	1 / 5	0.040	IR85-TW07-09C	0.94	0 / 5	0.043	0.088	0.094	0.1	No	--	--	--	No	Consistent with background
Nickel, Dissolved	10.0 - 10.0	3 / 5	19.5	IR85-TW05-09C	8.20	2 / 5	2.38	8.08	0.99	7.97	Yes	--	--	--	No	Within background range in subsurface soils
Potassium, Dissolved <sup>3</sup>	-- - --	5 / 5	852	IR85-TW05-09C	NSV	-- / --	NSV	646	NSV	3277	No	--	--	--	No	Consistent with background
Selenium, Dissolved	20.0 - 20.0	1 / 5	4.30	IR85-TW05-09C	71.0	0 / 5	0.061	8.86	0.12	3.14	Yes	--	--	--	No	HQ less than one, detected
Silver, Dissolved	20.0 - 20.0	0 / 5	--	--	0.23	-- / --	87.0	10.0	43	0.77	--	--	--	--	No	Not detected
Sodium, Dissolved <sup>3</sup>	-- - --	5 / 5	27,300	IR85-TW06-09C	NSV	-- / --	NSV	10,256	NSV	22508	Yes	--	--	--	No	Macronutrient
Thallium, Dissolved	30.0 - 30.0	0 / 5	--	--	21.3	-- / --	1.41	15.0	0.70	3.78	--	--	--	--	No	Not detected
Vanadium, Dissolved	50.0 - 50.0	0 / 5	--	--	NSV	-- / --	NSV	25.0	NSV	4.72	--	--	--	--	No	Not detected
Zinc, Dissolved	50.0 - 50.0	4 / 5	49.5	IR85-TW08-09C	81.0	0 / 5	0.61	25.3	0.31	42.1	Yes	--	--	--	No	Within background range

NOTES  
1 - Marine screening values  
2 - Count of detected samples exceeding or equaling Screening Value  
3 - Macronutrient - Not considered to be a contaminant of potential concern (COPC)  
HQ - Hazard Quotient  
NSV - No Screening Value  
UG/L - Micrograms per liter  
Generated by: Sara Kent